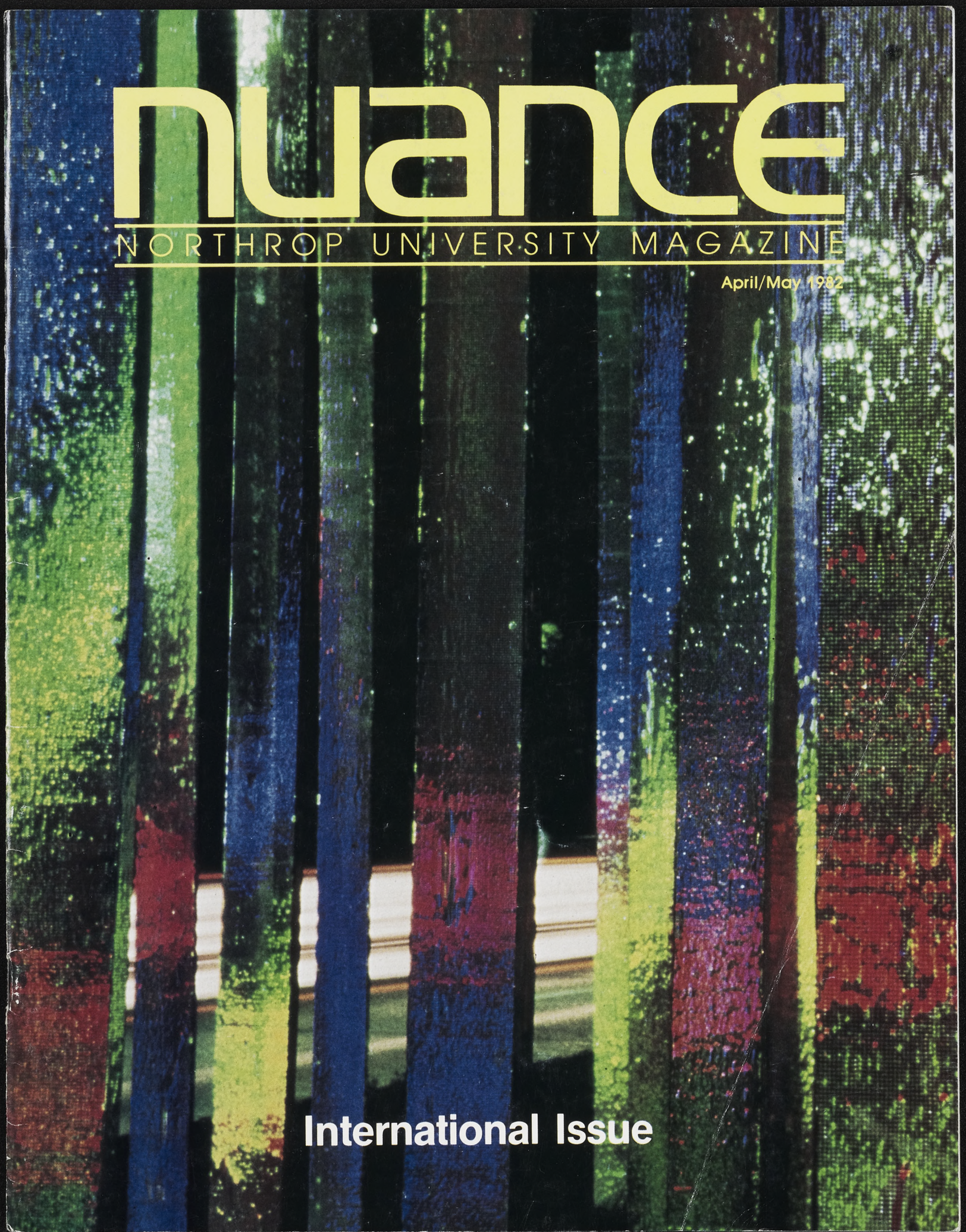

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April/May 1982

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NORTHROP UNIVERSITY MAGAZINE

April/May 1982 Volume 3, Number 1

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Dale Eldred's monumental light sculpture at the Kansas City Nelson Gallery. The 500-foot long procession of poles, each 16 feet high, are set in the lawn of the road divider and flame into color with the sunlight during the day and headlights at night.

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Fusion of art and technology creates new gallery

editor's note

If Columbus is a state of mind, 'a disposition to discover,' as Dali believes, and if Leonardo used more than just technical skills of invention, then there is more art to engineering than is commonly suspected.

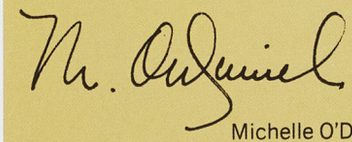
After a long association with construction, operation, and management of industry, engineering is branching into the communication arts, by request. Two new, and different, fields of engineering involve the transfer or translation of one system of knowledge to another.

The new systems engineers are being asked to explain and help integrate their technical fields into society. The Sloan Foundation provides major funding to schools for graduate programs encouraging technology-society interfaces. The engineer represents a vital link in this communication system.

At the other extreme, the new informational sciences are asking engineers to find ways to translate what they call 'expert knowledge' from experienced scientists into programs for computer banks or 'think-tanks,' which could help other researchers find new answers. This process of transferring human experience and ingenuity into a computer program, calls for an equal blend of sensitivity and technical skill on the part of the information engineer.

This issue of NUANCE participates in the interaction of technology and society, by concentrating on the relationships of new technologies to education, language, the judicial system, and the arts. In some cases, technology is restructuring the methods, if not the nucleus, of each field. The engineer is center stage in this re-organization.

However many specializations result from the interactive fields, and however diversified the profession of engineering may become, a certain stubborn trait of the engineer remains determined to wreak havoc on any over-complicated, weighty structures and reduce them, as Henry Ford described, to simple, streamlined basics, which is a good way to begin a new specialization.



Michelle O'Daniel

response

Rockwell Reprint

The article, "Future Flight: Beyond the Shuttle," (Spring 81) has finally found its way into the pages of our Rockwell News. Thank you very much for allowing us to use it, I think everyone will enjoy reading this article today.

Bob Howard
Editor
Rockwell News
Downey, Ca.

What a beautiful publication! Couldn't we get on an exchange list? It's an absolute joy to see such a publication, especially in aerospace.

Doug Lamont,
The Soaring Society of America
Los Angeles, Ca.

We enjoy reading all the stories you publish and hearing the latest news about the University.

Bobbi Trout
Carol Osborne
Santa Clara, Ca.

I was sorry to hear of David Hatfield's death. I am a motion picture art director and I came to him for advice on "Comes a Horseman." His enthusiasm and help was unique.

I subsequently donated my resulting work on the Lafayette Esquardrille to the Hall of Aviation History.

I think NUANCE is a very beautiful and fine publication and good luck for 1982.

George Jenkins
New York, N.Y.

NUANCE in Germany

A friend of mine living in San Francisco has recently mailed some material taken from your periodical NUANCE which I found to be extemely interesting.

Being a regular contributor to a German aviation periodical (LUFTFAHRT international), dealing with both historical and topical subjects, I would like to be put on your mailing list or to subscribe to NUANCE. The articles on John K. Northrop, Max Stanley and the Flying Wing have fascinated me no end.

Would it be possible to obtain all issues that have so far been published, so I'll eventually have a complete set of NUANCE? Many thanks in advance for any help that you may be able to give me in this matter.

Sincerely yours,
Hans Justus Meier
Germany

Flying Wing Take-off

Was reading "Response" column, Summer '81 issue. I was at Northrop Institute of Technology '48-'50 (AET '50), and saw the XB-35 fly back in. A good reference is Northrop Flying Wings by Ed. T. Maloney

Marshall E. Becker
Whittier, Ca.

I would very much like to thank you for the wonderful package of information, photographs and your absolutely fantastic publication, NUANCE. I requested the information for a book I am writing about the Travel, Transportation industry. The twofold purpose of this letter is to first thank you and secondly to request permission parts of the Winter '81 Commemorative Issue of Nuance and the Fall issue.

I truly appreciate the quality of your magazine and hope to do it justice in the upcoming book.

Lori Kaye, President
Molori Publications
Studio City, Ca.

Thank you very much for NUANCE. I have always been very interested in the Northrop Flying Wings and I only wish that we had one for our Museum. My close friend and fellow aerohistorian, Peter Kilduff, told me about your publication and suggested that I try to get on the mailing list for the benefit of our Library and the possible use of some of the material in our Newsletter. Thanks again for NUANCE, and I look forward to reading more about Northrop aircraft.

Robert H. Stepanek
Director of History & Information
Bradley Air Museum
East Hartford, CT

Jet Propulsion

I just finished reading "Jet Propulsion: A Fortieth Anniversary," in the Summer/Fall '81 issue of the Northrop University Magazine. I was one of the fortunate few to have been transferred from the Niagara Falls plant to the upper floor of the Ford Motor Company facility and later to Muroc AFB (now Edwards) as part of the XP-59A crew. Needless to say, Everett Welmers article brought back very vivid memories, and was very well done.

Jerome L. Ryan
President,
Stanley Aviation Corp.

40 YEARS OF PROGRESSIVE EDUCATION

For forty years, the philosophy of Northrop University has been education for professional advancement. This practical approach to learning was first established in a small aeronautical training school at Northrop Field, California. Since 1942 the University has expanded into the highly specialized and diversified Colleges of Engineering, Engineering Technology, Business and Management, and Law as well as the Institute of Technology and the Language Institute.

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Business Aviation

& GEORGE WING THE DERRINGER

George Wing could explain independence without saying a word. What he has needed, he has built, from the first light-weight, high strength rivets for aircraft to the world's lightest, high-performance twin-engine airplane, The Derringer.

Quietly, sometimes alone, and always with a measured, unhurried ease, he keeps inventing. Office walls at Wing Aircraft Company are covered with plaques, certificates, and honors, from NASA's Apollo Achievement Award, to the Los Angeles 'Inventor of the Year' Award in 1974, reflecting over forty years and forty patented inventions contributing to aviation and aerospace.

Half-smiling, with a calculated Mississippi ease, George Wing reaches into a top drawer, scoops up a handful of multi-colored metal pieces, and lets them scatter across the glass-top of his desk.

"This is the Hi-Shear rivet," he says, introducing the single-most important fastener in aviation and aerospace from the Mustang, P-51 fighter, to the moon and beyond.

"I designed this high-strength rivet to be easily installed," he said, "while I was about twenty-six years old and working at North American Aircraft."

When asked how he came up with the idea, he looked puzzled and laughed. "I designed it, because I needed it."

The simple, light-weight titanium rivets, ionized into brilliant greens, blues and golds, and impervious to temperature extremes, made possible the large airframe commercial airliners, by cutting the weight of the aircraft and increasing the strength of the frame. When the rivet was first used in the P-51 Mustang Fighter, it saved 75,000 hours of manpower in one month and cut the weight of fas teners to one-third.

Invention of the rivet gave George Wing the opportunity to venture out alone. North American kept the patent on the rivet, and George Wing took the patents on the tools to manufacture the rivets.

With $500 in U.S. War Bonds, he co-founded the Hi-Shear Rivet Tool Company behind a gas station, in a garage, in Hermosa Beach, California. "I really didn't know anything about business or about a machine shop," he said. "I learned because I had to." That could be the Wing motto.

The Hi-Shear Rivet Tool Co. within twenty years became the nation's leading producer of fasteners, explosive separation devices, igniters, boosters and electronic interface units for the aeronautics industry.

It was not the first time George Wing ventured out alone. In the summer of 1927, George Wing drove the family Dodge up the gravel road from Mississippi to Wisconsin in seven days. He was eleven years old and had to prop himself on pillows to reach the floorboard pedals and see over the dashboard, but he made the run in seven days, despite more than twenty flat tires.

That same summer, on his way to high school in Deluth, Wisconsin, George passed two bi-planes moored in Beloit field. "I ran the Dodge off the road, jumped out and climbed all over those planes. From that day on, I knew I was going to build aircraft," he said.

Hi-Shear's lightweight titanium rivets which have become the basic airframe and aerospace fasteners.

Since no one taught anything about aircraft or engines in those days, George borrowed every book in the Deluth Library on the subjects. "I kept notebooks of math questions that I couldn't figure out. Later, I asked my teachers to explain it to me," Wing reminisced. "Those notebooks, and there were quite a few, ended up packed and forgotten in a smoke house in Mississippi."

During the Depression, George

PHOTOGRAPHY: LEE JAPP

> "They found in themselves a sort of sixth sense of chance and direction because they had to, and as a consequence, many developed the fierce independence known to old sailors."
>
> The Aviator,
> Ernest Gann

'The Quicksilver,' a Derringer owned by Western Airlines flight demonstrator out of Torrance Airport, California.

Capta

Wing forgot his notebooks, left school, and took his curiosity directly to a place where his questions would be answered. Baltimore, 1932. At sixteen, he started to work for Glenn Martin building the China Clipper and the B-10 bomber. "You didn't have to know how to do something then," he recalled. "You just did it."

By 1943, he had worked with Sikorsky, Ryan and Monocoupe and had his own plans for building a small, two-place sports plane. It was an idea he would think about for the next thirty years.

Meanwhile, George Wing developed the Hi-Shear Rivet Tool Co., designed a robot to handle and process 450 pieces per minute, and started another business venture, the Transland Company, which designed and developed the AG-2 Agricultural Airplane. With Transland Co., Wing became known as a major contributor to the design and development of aerial applicating equipment for agriculture and fire-fighting. But George Wing is primarily an aviator who builds aircraft, lives aircraft, and thinks aircraft.

Like all aviators, he can recount exactly when he saw his first aircraft, which one and where he flew, and the day he knew he would always be in aviation. Like most aviators, he knows how to tell a good story. "I saw my first airplane in a barn in Mississippi when I was five years old. It was probably a Flying Jenny some barnstorming pilot was flying through," he added. "And he charged .25 cents to climb in it for everyone over six years old. Of course, I lied about my age."

At sixteen, he had his first flight lesson in an American Eagle with an OX-5 engine. He would trade pilots a ride to the airstrip in his family Dodge for a twenty minute lesson in the air.

Today, at 66 years old, George Wing is making the contribution he has waited thirty years to make. He is manufacturing The Derringer, which he calls the "Ferrari of Airplanes."

Pointing to the Federal Aviation Agency Type Certificate on the wall behind his desk, he smiled, "That's my Rembrandt. Even though it is only on 8½ by 11 paper, it cost me more than a Rembrandt to get the brand new design for The Derringer certified."

With a cost of over $8.5 million dollars to certify the prototypes, it is not surprising that few individuals venture out alone into the design and manufacturing of private aircraft. George Wing, as President of Wing Aircraft in Torrance, California, represents the only light twin-engine aircraft manufacturer on the West Coast. Most lightplanes come from the bigger corporations in Lock Haven, Wichita, and Vero Beach.

The Wing Derringer, as its designer and manufactuer likes to point out, is built with an attention to perfection in construction that is only found in Seattle and St. Louis.

Running his hand over the smooth stretch-formed aluminum skin of The Derringer, George Wing explained its satin-smooth finish. "Notice how there are no patches, or lines of rivets. Each wing is made of one piece of chemically-milled aluminum from wing root to wing tip, making the leading edge and front spar leakproof fuel tank. You won't lose one drop of fuel out of these wings," he affirmed.

There are only eight large sheets of aluminum used in the entire fuselage. To make an even lighter aircraft, the skins are chemically-milled to remove areas of the metal where strength is not needed. The entire sheetwork is zinc-chromated and alodined for a flawlessly smooth surface. After all the assembly, the skin is alodined again to remove any scratches before

---

George Wing, President and Owner of Wing Aircraft Company, has been a member of the Board of Trustees of Northrop University since 1968. His long-standing commitment to employing the University's graduates has guaranteed that Northrop University engineers have worked on some part of every major U.S. space project.

rlines
a.

Captain Al Osterman, is leased by Wing Aircraft as a

Talented test-pilot and marketing sales manager of the Derringer, Joanne Alford, is the first woman to join the Professional Racing Pilots' Association, build and fly her own aircraft.

painting. All rivets are countersunk level with the surface, so as not to interfere with any airflow over the surface of the aircraft.

The fast, sporty little two-place twin flies at a maximum of about 170 miles per hour and completes a 360 degree roll in one slight second.

The first Derringer sold went to Ernest Gann, the author of over twenty books on aviation including The High and the Mighty, and Fate is the Hunter.

Just returning from a two month trip in his Derringer, Ernest Gann said, "I went all over the Carribean with this plane, by myself. I think it's exciting flying."

When Richard Bach, author of Jonathan Livingston Seagull, flew The Derringer, he wrote in the frontispiece of George Wing's copy: "For George Wing! Who built in thought and in metal one of the loveliest machines I've ever touched and flown."

The Derringer is built as it is ordered, customized to each owner's specifications. There is no assembly line anonymous aircraft produced to sit with dealers, and as a result, The Derringer, has no dealer markup.

"I am building a fine aircraft for the people who appreciate the specialty quality, the people who fly Falcons and Learjets, and need something sensible for shorter trips," Wing explained.

Not everyone understands Wing's uncompromising insistence on a Rolls-Royce quality twin engine for one aviator and a passenger. Sometimes, even George Wing questions himself. "If I didn't have this Derringer to build, I could be working on a helicopter design, or robots."

After 50 years in aviation, George Wing remains primarily an aviator who builds aircraft, with an attention to each piece, and with some of the same flourish that characterized the first barnstormers he saw fly over Mississippi.

VERSATILITY OF THE B-1B

Infinitely small on a radar screen, quick as a jet fighter, and as low as a terrain-following missile, the B-1B approaches invisibility.

"It looks like a fighter, flies like a fighter, and carries more payload than the B-52." Tom August, Technical Training Specialist, at North American Aircraft, opens his training class on the B-1B with rapid-fire descriptions. "The sleek blend of fuselage and wings, built to sweep back at high speeds into a near delta formation allow the B-1B to hug the terrain at high subsonic speeds at near ground level," he begins. "This kind of 'nap of the earth' flying is a first for a heavy bomber," he adds. "And it makes the aircraft extremely difficult to detect and track among all the hills, towers, mountains and trees which also appear on the enemy radar screen."

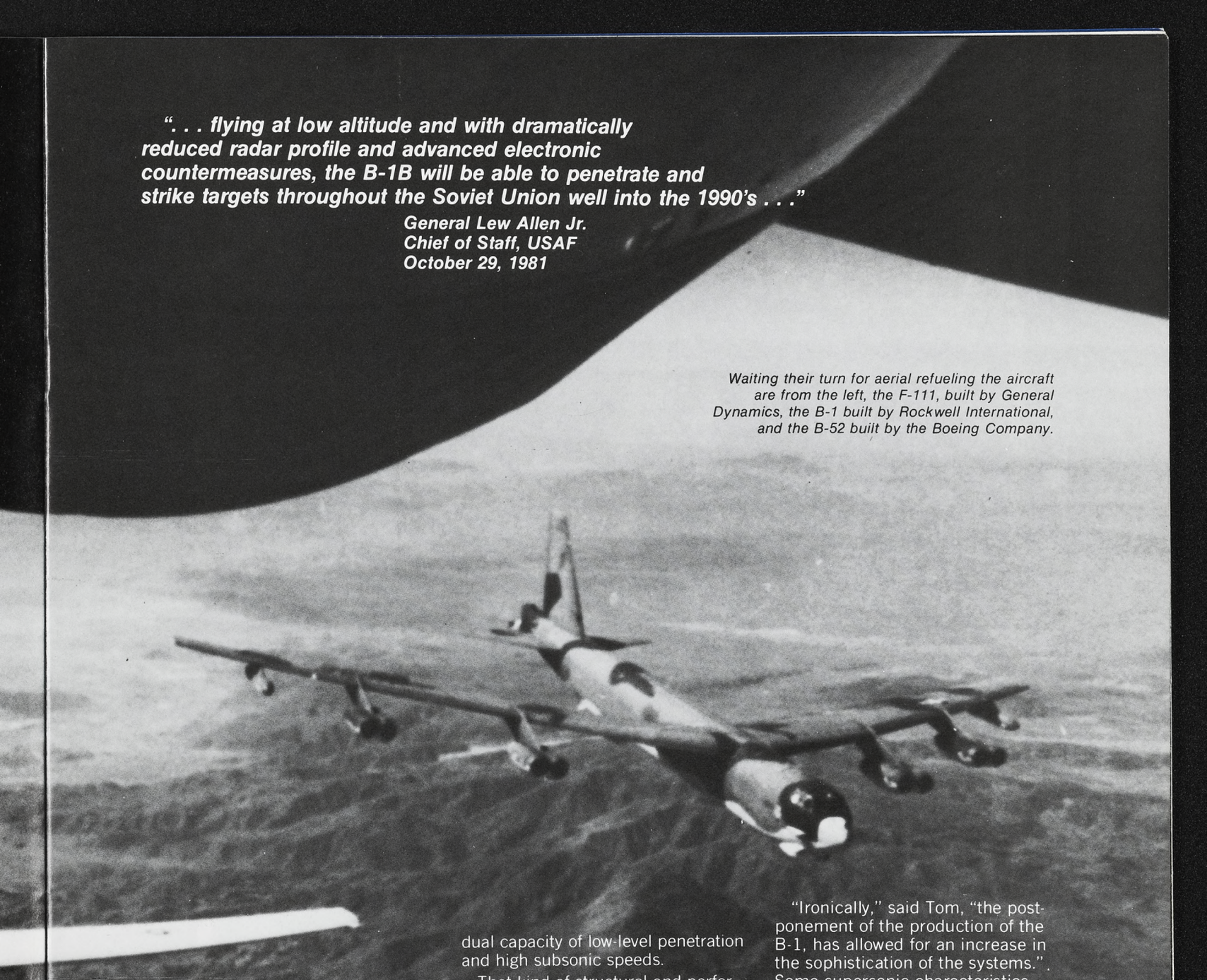
Armed with 100,000 pounds of nuclear or conventional weapons, including the cruise missile, and 11,000 pounds of offensive and defensive avionics, the multi-role bomber, if not entirely invisible, is substantially invincible.

"It takes a little jostling of comparisons before you can really appreciate the full significance of the B-1B," August continues. "There is a smaller fighter-bomber, the Fb-111, which swings its wings and carries a large bomb load for an aircraft of its size. The B-1B, however, is a heavy bomber. While only about two-thirds the size of the B-52, it carries a substantially increased payload and offers greater range because of improved engine performance and advanced aerodynamic technology. The same technology resulted in improved fighter-type handling of an aircraft the size of a 727 and a payload twice that of a heavy bomber, coupled with increased payload capacity it makes the B-1B the first fighter-like bomber, rather than just another fighter-bomber.

"Any real appreciation of the B-1B should begin with some back ground comparisons," August said. "The

". . . flying at low altitude and with dramatically reduced radar profile and advanced electronic countermeasures, the B-1B will be able to penetrate and strike targets throughout the Soviet Union well into the 1990's . . ."

General Lew Allen Jr.
Chief of Staff, USAF
October 29, 1981



Waiting their turn for aerial refueling the aircraft are from the left, the F-111, built by General Dynamics, the B-1 built by Rockwell International, and the B-52 built by the Boeing Company.

current heavy bomber of the Strategic Air Command, the B-52, has been flying for more than 30 years. It has been modified and restructured for low altitude missions, but was originally designed for high altitude bombing. Riding in a B-52 on a low-altitude mission is like riding a roller coaster with marbles on the track," he added. "It just was not designed for that kind of turbulence."

That's where the B-1B comes in. It was designed with the strength to handle low-level turbulence, and is expected to last well over thirty years. Engineered with small vanes on either side of the forward fuselage to diminish the effects of turbulence at low level, the B-1B also flies at supersonic speeds at high altitudes and is the first heavy aircraft with the dual capacity of low-level penetration and high subsonic speeds.

That kind of structural and performance flexibility is possible only through the use of advanced technology in manufacturing and systems design.

For example:

An EMUX or electrical multiplexing system, controls many of the major B-1B subsystems and eliminates over 32,000 wire segments which otherwise would be needed to interconnect the thousands of electrical devices on the airplane. By multiplexing, the EMUX uses only two small, two-wire cables for control and signal transfer and represents the most advanced system ever devised for electrical power control and monitoring in large aircraft.

"Ironically," said Tom, "the postponement of the production of the B-1, has allowed for an increase in the sophistication of the systems.". Some supersonic characteristics were traded for increased aerodynamic efficiency, greater payload capacity and a world-wide range capability.

The radar reflectivity of the B-1B will be one-tenth that of the original B-1A prototype which had a radar cross section one-tenth of that of the B-52. Anti-radar material on the surface of the aircraft and a change in the engines' air inlet ducts greatly reduces the B-1B radar signature head on. In addition to its low radar observability, the B-1B also has the first 360 degree radar detection capability, so that the tail is covered, the sides are covered and the front is covered. All of this with a crew of only four. This is in comparison to the six airmen per B-52, or twelve airmen for two B-52's delivering the

same payload, a potential saving of 66% in human life before the B-1 gets off the ground.

The offensive avionics system, concerned with the navigational and guidance components and payload delivery, allow the pilot to come in under radar at subsonic speeds and fly in automatic terrain-following mode as long as necessary. "The B-1B is the first bomber with the dual capacity of flying at supersonic speeds at high altitude and then penetrating at low level to deliver weapons and returning to high level altitude," Tom clarified. "Weapon delivery that close to target has been very difficult. The B-1B, with its quick responsive handling, can deliver the weapon at close range and escape before being endangered itself by the blast. That kind of hit and escape maneuver has usually been reserved for smaller aircraft," he said, "and is remarkable for an airplane weighing in excess of 400,000 pounds."

In another comparison, August points out that while the B-52 must fly at or below 390 miles per hour before bomb delivery, "The B-1B can deliver at high subsonic speeds at near ground level with an accuracy that is simply awesome."

Self-sufficiency is another unique feature of the B-1B. "It can sit on the end of a ramp with nobody in it, and when an alert sounds, it can be crewed, started up and scrambled in a shorter time period than most fighters," Tom said. "If the crew is already aboard in a high alert status, from the moment they get the word until the wheels are rolling in take-off, it can be even shorter." From the standpoint of logistics, the B-1B has made tremendous advances. Unlike the B-52, it has an onboard auxiliary power system that eliminates the need for ground power equipment for engine starting.

The B-1B, with its quick-response systems, is designed to operate from less sophisticated airfields with shorter runways than those now required for the B-52. This versatility makes it almost impossible for an enemy to aim his missiles for a surprise attack because the B-1B force could be scattered throughout the country and moved at will. It also makes it possible for the B-1B to carry out two-way missions, that is to fly a mission en route to an allied base, land, be refueled and rearmed and then return home on another mission.

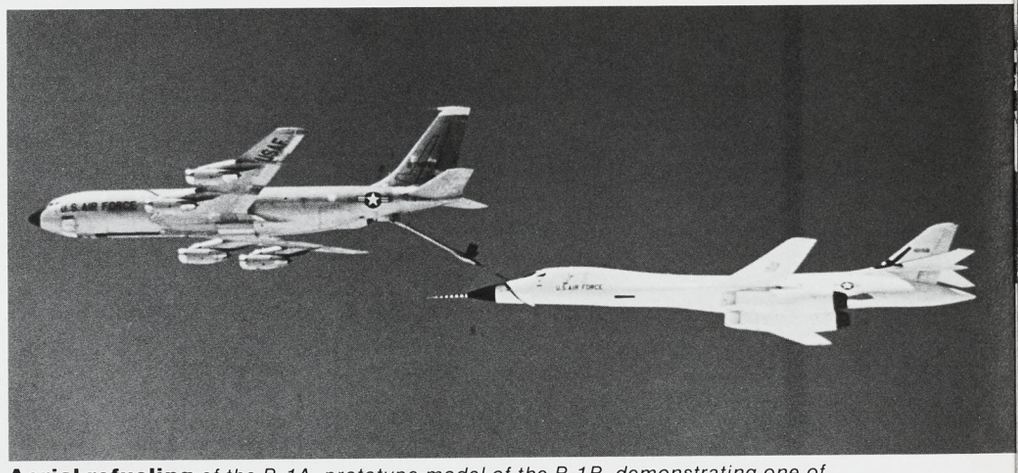
Aside from its operational and mission versatility, the B-1B has a versatility built into its airframe and engine design which allows for rapid engine changes at the squadron level. "The B-1B has interchangeable engines which can be replaced in less than thirty minutes by squadron maintenance crews. The single or neutral engine concept permits any engine to fit into any slot, unlike the B-52. This greatly simplifies maintenance operations," August explained.

Engineering with a sensitivity to human factors in both flight operations and maintenance has made the B-1B a machine like no other before it. A central integrated test system monitors and predicts failures and failure rate percentages. The CITS constantly monitors more than 3,000 places in the aircraft, recording temperatures, pressures, fuel system and integrating the data in one system that interprets the data for trend projections. The ground maintenance crew need only read the computer printout to find which parts will need replacement and when.

"The fighter pilot will be at home in the cockpit of a B-1B," August explained. "The aircraft flies with a stick instead of the yoke commonly found in large aircraft. Additionally, all the instrumentation in the cockpit has been placed in the traditionally expected areas. It's a relief to react quickly for a control and find it there," Tom added. The use of a stick greatly reduces pilot fatigue on long missions. With nearly 2,000 hours of flight testing on the four B-1 prototypes already produced, the program has been called the most successful flight test in the history of the Edwards Flight Test Center by the Center's commander, Lieutenant General Tom Stafford, U.S. Air Force (Retired), a former U.S. Astronaut. "One of the reasons for this success," suggested Tom, "is the tremendous sensitivity to human factors and superior detailed planning."

Several times a week, August travels to Edwards Air Force Base to conduct classes for the training of personnel at all levels of work concerning the B-1B program. The rest of his time he develops and documents texts for new courses.

"It took a real cooperative engineering achievement to make an aircraft so easily operated by all the different people who are going to maintain it and fly it," he added. "I think that is a good conclusion to the introduction of the B-1B," Tom smiles. "A plane that performs like a fighter, delivers like a bomber, still manages to present one of the easiest maintenance and operation systems ever made." There is a certain concensus of opinion among the contributors to the B-1B program. They feel they are working on the protytype of an enduring classic aircraft. nu

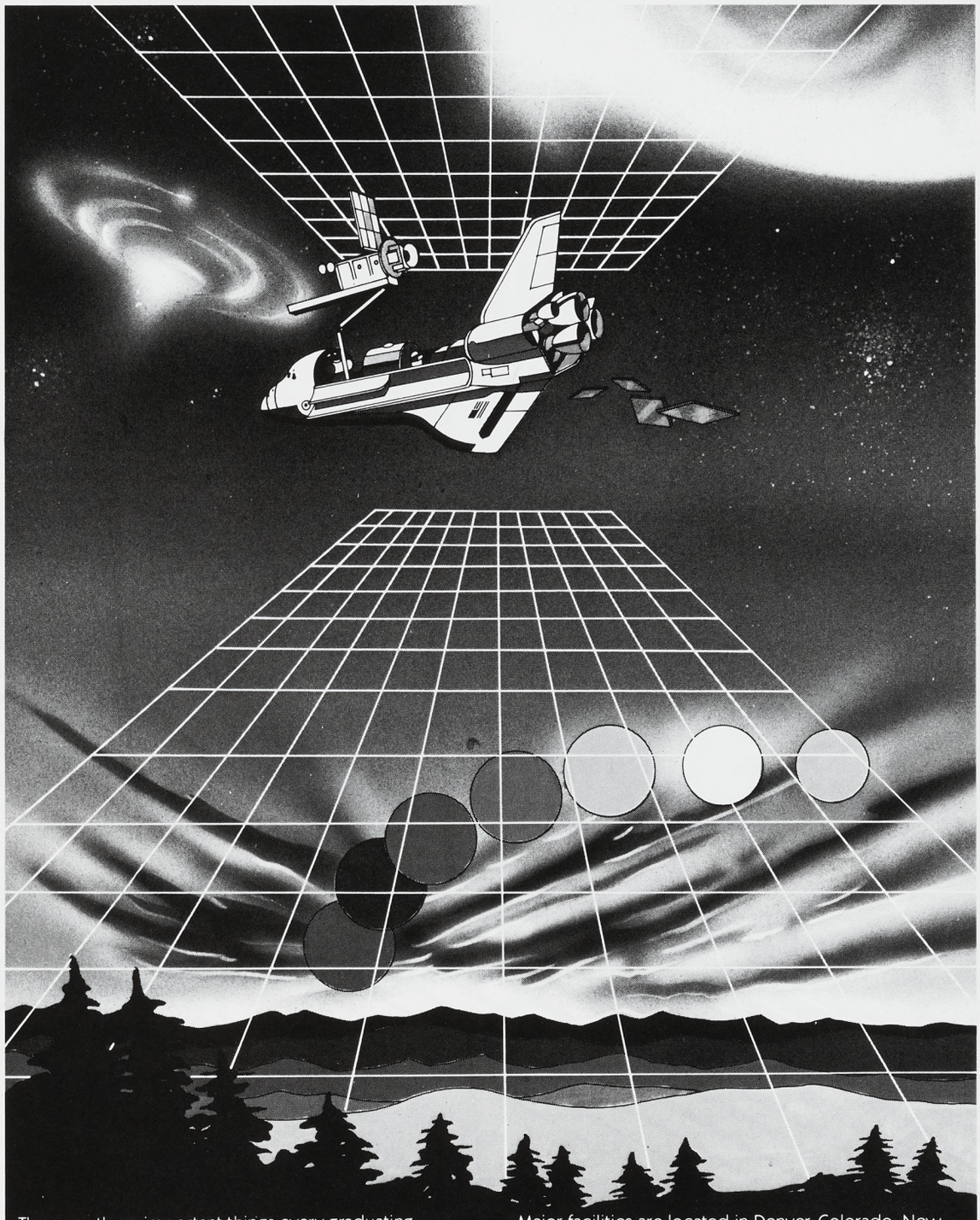


Aerial refueling *of the B-1A, prototype model of the B-1B, demonstrating one of the first systems of refueling through the foreward section of the nose, rather than behind and above the cockpit.*

Tom August writes the textbooks on Airframe and Powerplant Maintenance and Electricity currently used by the Institute of Technology at Northrop University. Today, he is teaching and writing the texts for operations and maintenance for the B-1B long-range combat aircraft in the Technical Training Program at North American Aircraft Operations, Rockwell International, El Segundo, California.

GRADUATING ENGINEERS

REACH FOR TOMORROW WITH MARTIN MARIETTA AEROSPACE



There are three important things every graduating engineer should know about Martin Marietta Aerospace:

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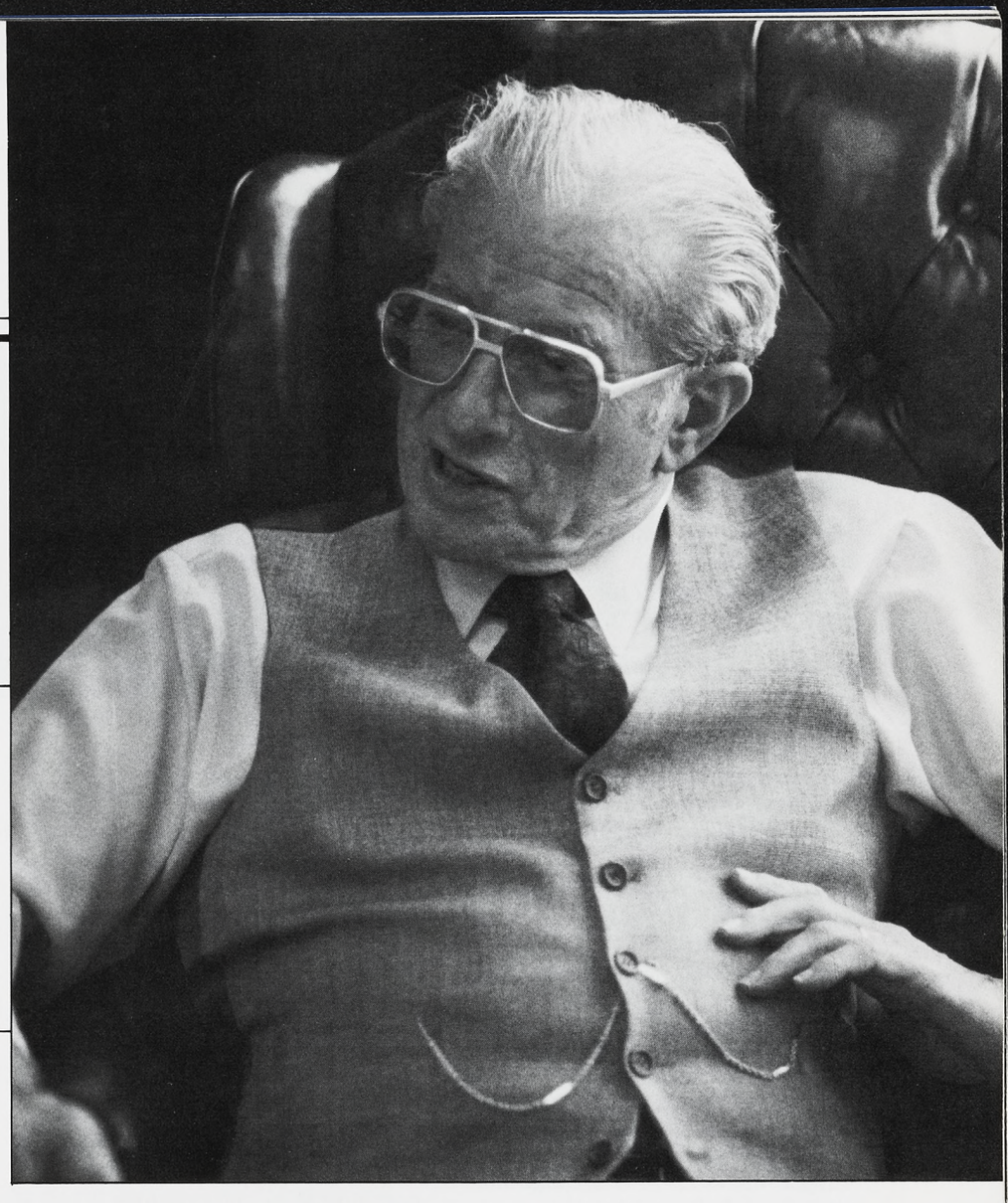
profile



The Honorable Harry T. Shafer (retired), Judge of the Los Angeles Superior Court, Family Law Division, is known for his quick wit and sharp eye in the courtroom.

Since 1980, when he joined the Law Faculty at Northrop University, he has spent many late evenings teaching Family Law, Techniques of Judging, and Resolution of Disputes and Arbitration and Negotiation. Students are in his courtroom by eight a.m. the following morning to watch his style in action.

The Infinite Variety Of Judge Harry T. Shafer

by Michelle O'Daniel

Harry T. (Theodore) Shafer, Judge (retired) is not retiring. He is only beginning another episode. He calls it "Rent a Judge." The idea is, he explains, "You can't buy me, but you can rent me."

Wit is the modus operandi of the Shafer style which has presided over the Los Angeles Superior Court's largest divorce and property settlements for the last six years. His courtroom is always bristling with press and spectators, as eager to see Zsa Zsa Gabor and Farah Fawcett as to hear the wit and wisdom of Judge Harry Shafer.

A Graduate of Yale University class of '34, and Columbia University, School of Law '38, Harry Shafer has never let a heavy sense of decorum immobilize his wit. In other words, he feels equally indebted to the years he spent as a professional juggler in New Haven and the years as a house to house peddlar in Compton, California.

Today, fifteen floors above street level, Harry Shafer sits surrounded by a few select souvenirs of forty years on (or very near) the bench.

The radio behind his chair announces the ninth inning. Dodgers in the lead. The Judge swivels past Sugar Ray Leonard's boxing gloves, the photos of Milton Berle, his three children, four grandchildren, and Ruth, wife of forty-two years. He smiles possesively, gesturing out the picture window, "This is a view God would have, if he could afford it."

Quips, quotes and anecdotes are standard ammunition. As he says, "I shoot from the lip."

Reluctantly, he flips off the baseball game and sits up straight behind mounds of letters. Harry T. Shafer, Judge, law professor, former juggler and peddlar, is making another change in careers. His live T.V. series, "Family Court," is being marketed and another television

series, based on the experiences of a unique and courageous judge, is being completed and will be considered by CBS. Abby Mann, of "Judgement at Nuremburg," fame, is writing the script. Harry Shafer is technical advisor.

Another episode in the career of Harry Shafer is about to begin . . .

Nuance: How does a retired Judge become a consultant?

Shafer: Here's how it goes. I am sending a letter to law firms saying that I am making myself available for mediation of disputes arising out of marital dissolution actions.

Nuance: Is this common practice?

Shafer: It's becoming more common. They call it "Rent a Judge."

Litigants can come to me and get another view, for instance. I can tell them pretty much how I think their case will come out. Or, they can come to me for binding arbitration, where the litigants agree in advance to be bound by my decision as an arbitrator. Or, they can request me as a Judge Pro Tem. If they both request me, the presiding judge will appoint me to hear the case.

Nuance: What do you feel are the most needed reforms in the judicial system?

Shafer: I think we should do everything in our power to get the matters over quickly. And I'm not blaming the Calendar of the Court. It is extemely difficult with the limited personnel, but there should be some way of calendaring so that people just don't wait a year to a year and a half in family law for the case to come up smoldering. During that time, someone may be pulling fast tricks with the business.

Nuance: What is your purpose to work through television media?

Shafer: Right now, I have a program called "Family Court." It takes place on camera with real litigants, real lawyers, real judges, and they all agree in advance to be bound by my decision. If the program sells, it will go into production in June for full presentation.

Nuance: You mean actual decisions are being made in the program?

Shafer: Absolutely, because they agree in advance to arbitrate them. Of course, litigants get paid $500 each, so its not hard to get their consent.

Nuance: So, this helps get divorce out of the adversary system?

Shafer: Yes, the whole purpose of using television is to augment my objective of getting divorce cases mediated before trial.

Nuance: How do you envision this process of divorce by mediation?

Shafer: Well, my plan is, in the first place, custody matters should not be tried. Of course, they shouldn't be on television either. They should be taken out of the court system and perhaps be resolved by a mediator, who is a judge.

People should not have to take the stand in any posture of fighting with one another. In other words, each parent should have the opportunity of telling their story about why they should have custody, perhaps referring to a court-appointed child psychiatrist, or child custody investigator.

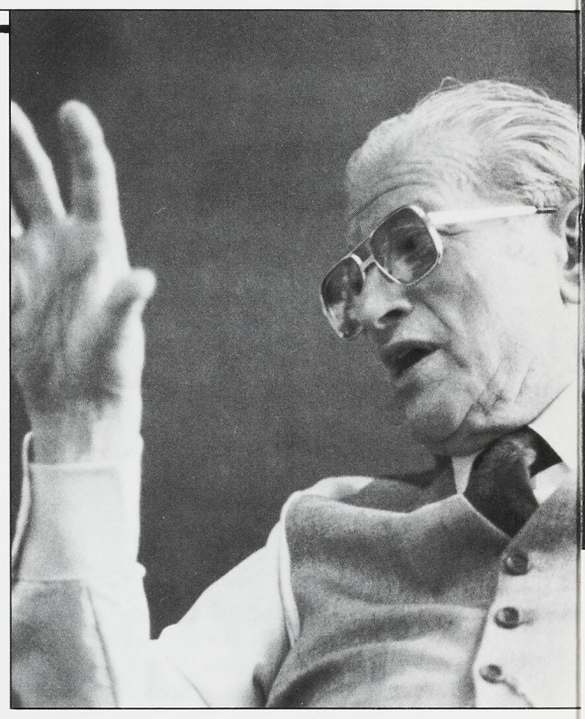
There should be no sworn testimony. Because once they are sworn in, then the lines are drawn and the battle begins.

Once all the discovery has been made through mediation, then the litigants should be called into the judge's chambers and that judge should give them an opinion on how the case is going to go.

It should be an advisory opinion, or, if the parties agree to binding arbitration, they can avoid dragging out a case for ten or twenty days.

Sometimes I look at these people and I think, 'Here these people have lived together, had children together, worked together and now they have gone to war. They called up the War Department and now they sit looking at one another.' I often get the feeling they wonder, 'How did I get in this mess?'

Nuance: How can they avoid this war zone?



Shafer: I think it is part of the function of the lawyers to help the litigants avoid the adversary system.

Nuance: You spend quite a bit of time in Chambers. How much of the actual decision making process can be done out of Court?

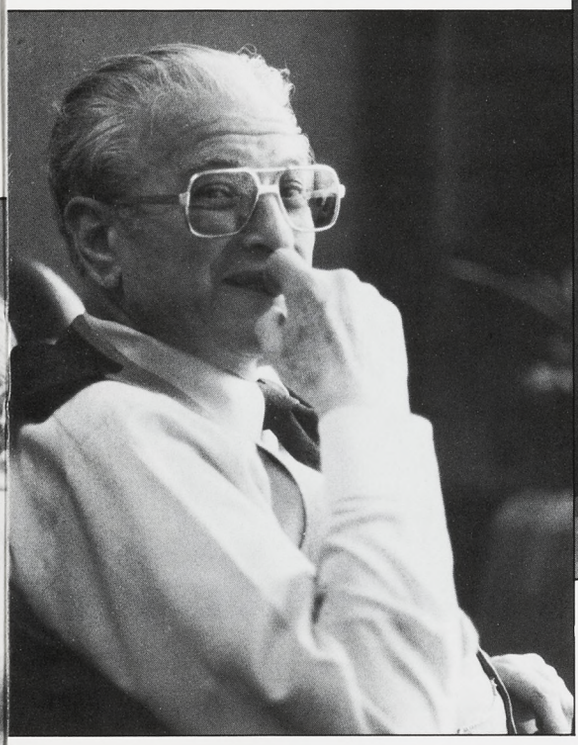
Shafer: I think good work can be accomplished in Chambers provided the litigants don't get the feeling they are being left out.

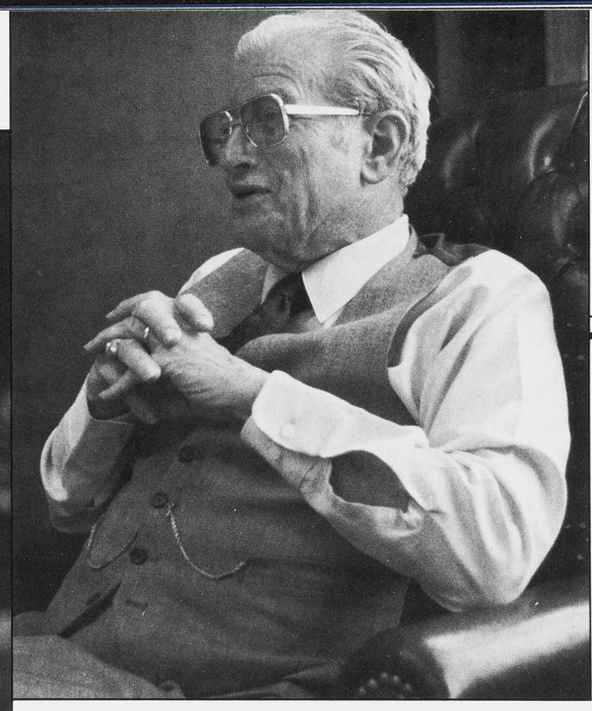
What I do is, I speak to the lawyers on what the issues are, then I welcome the litigants in. I try to get the lawyers to stipulate that I can talk to the litigants individually.

Nuance: Do you ever change your mind in the course of a trial?

Shafer: I'll change my mind. I'm not quite like the judge in the proverb that says: 'The poor judge is the one who can't make up his mind, and the worst judge is the one that changes his mind.' I don't operate that way. I will say this, I am willing to express my tentative opinion at any time during a case in order to alert the lawyers to the posture of their contentions.

To give you an example of how I change my mind, I had a case involving millions of dollars about two





months ago. One of the unsolved issues involved a 12 carat ring that the husband bought for $145,000 on an occasion. So, you would figure that this ring is a gift, and I said, 'Oh, why don't you give her that ring?' He said, 'No. It's community property.' I said, 'How are you going to prove it?' He said I had to hear the evidence. I heard the evidence and I held it as community property. I agreed with him.

I also think a judge should make every effort to get the lawyer to try to settle the case as soon as possible. Now, that's very difficult, because the judge is giving a view, and they claim he's prejudging the case. So, you have to watch that very carefully. But I am willing to take that chance.

Nuance: What are the times you feel you've had a really positive effect on people's lives?

Shafer: I had a case once where two brothers were fighting over custody of a child. They were brothers, both professors. One was from Israel and the other from Michigan State. Really bright people. But the natural child of one of the brothers, had been raised by the other brother, so they got into a real dispute. The presiding judge said he thought it would never be settled. It was ready for trial and I worked on it. Eventually, I said, 'Why don't you both go out and have lunch?' This was over a period of two to three days. They said, 'Well, maybe we will.' And as they reached the door of my chambers, they fell into each others arms.

Nuance: You are known for your ability to make decisions quickly in court. How do you do this? What do you look for?

Shafer: I prepare for the case. I study the briefs and I take a lot of notes. Then, I go in and cut through the smokescreens.

Nuance: Why do people call you an 'unorthodox judge?'

Shafer: I guess, for one thing, because I am one of the first judges to go out and visit the homes of the litigants. I take a look at the property in dispute. It's called "Have Gavel Will Travel." Besides, you get a lot of good coffee cake.

Nuance: Do you think you are fair to women in court?

Shafer: 50% say I am. 50% say I'm not. I guess that's pretty fair.

I'll say this, after long marriages, I think women generally don't come out well because men can keep on with their lives, having girlfriends, the business and all that. Women have to adjust. No matter how much money they get, a women 60 years old needs a million other things.

Nuance: You are considered quite outspoken in the Court room.

Shafer: Don't you think it's better to have a judge who lets you know how he's feeling? He should show concern, that's the main thing, instead of just saying, 'Objection!'

'Objection overruled!'

'Objection sustained, motion denied.'

People want to tell their story and they want a judge who listens and says 'I can see where you're coming from.'

Nuance: You have a very serious courtroom concern, and then you have comic relief side.

How do you see your comic side as appropriate in court?

Shafer: You have to have a light side. There is so much animosity, so much bitterness in divorce.

You get these people who come in after 20 years of marriage and say 'He's cheating on his income tax.' I take a tolerant attitude. I say, 'Well, that's for the IRS, I'm the INS, that stands for I'M NO SNITCH.'

(sings a little "Love thy Neighbor!")

Nuance: I heard you tell a lawyer after he had recited legal precedent for ten minutes, 'Just what do you want?'

Shafer: That's the well-known 'bottom-line.' If people want to play games in the courtroom and have our system go along this way where lawyers feel they win and get their client everything they want, if that's victory, I don't want to be part of it. There's no room for that in divorce, not in an area that has so much blood and sweat and tears. Nobody wins in divorce.

Nuance: How would you assess yourself in three words or less?

Shafer: 'Looking for me.' All my life I've been looking for me. (Smiles.)

In four words I can tell you how I stayed married for 42 years: 'We worked at it.' That's the best way to describe it. nu

教育-智慧之窗

The Corporatio

Ed

BY
Paul S. Larudee

Two of the most dynamic trends in American education today are corporate training to which $35-40 billion are devoted each year[1] and foreign student enrollment in higher education, which has been doubling every decade.[2] It is not surprising, therefore, that the convergence of these trends should account for an important new force in education — one whose potential has not yet been fully realized, and whose specific needs have only begun to be addressed. This force is corporate sponsorship of foreign students.

THE CORPORATE-THIRD WORLD CONNECTION

Who are these students and how have corporations become so involved in their education? A large part of the answer can be found in the huge development contracts between corporations and third world countries. Increasingly in recent years, these contracts have stipulated the development of the country's human as well as natural resources. Some have required that a certain percentage of that country's nationals hold managerial or professional positions by a certain stage in the project. Others have further specified the proportion of nationals who must be trained into such positions by the companies, rather than recruited from the available pool. Either way, company-sponsored training programs have become a primary means of attaining the manpower goals set forth in these contracts.

THE CORPORATE-ACADEMIC CONNECTION

Since these goals typically can be met only by degreed candidates, corporate training programs have turned to institutions of higher education for the resources needed. Some programs, such as master degrees in business administration and management, or associate degrees in technology, have been brought to the project site, allowing employees to enroll part-time while remaining on the job. Others, such as bachelor degree programs in engineering or computer science have demanded traditional full-time enrollment on the university campus itself. In both cases, however, the special needs of these programs have necessitated increased co-operation between the universities and the corporations.

Such cooperation is not new. On the contrary, corporations have long recognized their dependence upon universities for both manpower and research. Similarly, universities have depended upon business for financial and political support, and for much of their raison d'etre-the market for their graduates. The symbiotic relationships between such institutions as the University of Delaware and E.I. Dupont, General Motors Tech and the General Motors Corporation, are testimonies to such

Paul S. Larudee, received his M.S. in Teaching English as a Foreign Language from the American University in Cairo and his Ph.D. in Applied Linguistics from Georgetown University. He has held a National Science Foundation Traineeship at Georgetown University, and a Fulbright-Hays Lectureship at the Lebanese National University in Beirut, Lebanon. He is currently working for a large International Corporation.

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tion And International Education Link

mutual interests, but even these partnerships represent only a small fraction of the corporate-academic connection.

SPECIAL PROBLEMS

Nevertheless, degree training of foreign nationals differs from previous spheres of cooperation in a number of significant ways. First, it is typically non-contractual. Rather than designing a program which is specific to the company's needs, the university simply enrolls the students in its standard degree programs. Second, it is non-bursary. Rather than granting scholarships to qualified students and then offering jobs to some of them upon graduation, the company employs the students first, and then sends them to the university as a training assignment. Finally, it has profound cross-cultural dimensions, and while companies may have had experience in placing their American employees in foreign environments, the converse is less frequently the case — especially when the environments are, as is often the case, remote from the companies' own offices.

Corporate experience with scholarship programs and university experience with foreign students may initially have led both institutions to expect few difficulties in implementing these new training programs. As they have discovered, however, the differences cited above often result in major problems, which can seriously impede the success of the programs.

The first of these is the problem of program availability. With most training programs, this is solved by simply choosing an appropriate site, obtaining appropriate facilities, and hiring or contracting suitable staff. To do this for as many as 10-20 undergraduate degree programs, however, would be tantamount to establishing one's own university. As a result, companies must seek out existing programs. Unfortunately, the fields which they require are precisely those which are in greatest demand today — engineering, computer science, and business. To make matters worse, cutbacks in public funds at state universities have restricted availability even further — to the extent that some have closed out-of-state admission to these programs altogether. It goes without saying, therefore, that some specialized programs, such as systems engineering, computer engineering, and industrial management, are either exceedingly few in number, or, like petroleum engineering, so restrictive in their admissions policies that they screen out virtually all foreign students.

A second problem is that of university admissions policies. The university ordinarily considers applications on an individual basis, while the company must often plan on group placement. The denial of one or two applications can therefore block placement of an entire group. In addition, university application deadlines and selection timetables can confound company planning.

Academic institutions are accustomed to working with much greater lead times than businesses, and businesses usually require shorter response times. Thus, a company may select and recruit its trainees over the period of a few months, only to have them wait up to a year from the time of application until the start of classes. On the other hand, universities which pool applications before selecting those eligible may not inform the applicants of the admissions decision until many months after the application is received. Both individual applicants and company training programs can make contingency plans by applying in advance to other schools. The company, however, must plan for the trainees as a group, while the individual does so only for himself. Such delays can therefore impede the company's ability to select a suitable site.

A third problem is that of employee supervision and accountability. This is a problem because, as stated earlier, the training programs are not merely scholarship grants made to qualified students; they are work assignments given to company employees. No matter how extensive a company's training organization, it simply cannot adequately supervise employees who are scattered on various university campuses. Considerable assistance is therefore required from the universities. Furthermore, even when this assistance is available, it is frequently performed without benefit of a contract, since the employees are usually enrolled as regular full-time students in regular academic programs.

Finally, there is the problem of support services. When a company grants a scholarship, it makes an investment in a general sense; it invests in the future of its industry. If a student fails to remain on scholarship until completion of the degree, the scholarship is transferred to another candidate without significantly altering the outcome of the investment. The student's individual success or failure is therefore not of critical importance to the investment.

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If, on the other hand an employee fails to complete a training assignment, the company suffers a direct loss in terms of its manpower objectives, and a considerable financial loss as well.

Attrition and retention are therefore as much of a consideration in these training programs as they are in the company's own offices. Unlike the company offices, however, there is no immediately available industrial relations department to implement the policies and provide the services which protect its investment and improve its retention rate. For many of these services, therefore, the company must rely upon the university. This is especially true of the critical settling-in period, when culture shock and disorientation take their toll unless extensive assistance is provided until the individual feels comfortable and secure in the new environment.

Educación dirigida hacia la búsqueda de nuevos canales de comunicación

INNOVATIVE SOLUTIONS

Industry and academia are aware of some of these problems, and have begun to seek solutions. Other problems, however, have been frought with misunderstanding and disappointment. The shortage of accredited engineering programs is an example of the former. While the problem reached an acute stage only recently, industry has been quick to respond, primarily in terms of outright grants such as the one for $15 million from the EXXON Foundation.[3]

One of the biggest problems, however is faculty recruitment, which remains relatively impervious to simple financial solutions. It is no secret that potential engineering faculty are offered industry positions which pay up to three times the usual university scale. Even the most generous of grants, however, cannot make up for that difference because of the inequity which would result among faculty salaries within the universities. One solution would be to create endowed chairs, the salaries for which are independent of the university's general scale. Such chairs are ordinarily reserved for distinguished faculty, however, and probably cannot be provided in sufficient numbers to meet the need by themselves.

Another, more innovative solution,[4] is the loan of experienced engineers from industry to universities for teaching assignments. This would provide universities with needed faculty, while enhancing the professional development of the companies' engineers. Furthermore, such industry representation in academia carries the potential for vastly increased responsiveness to each others' needs in general, and to the needs of the training programs in particular.

The other problem areas—those of admissions policies, supervision and support services—have all too often been inadequately understood and dealt with. The academic institutions often interpret the companies' requests for exceptional treatment, assistance and information as attempts at favoritism for their employees, and the companies often fail to appreciate the staffing, budgetary and organizational obstacles which prevent universities from providing the services which the companies require.

The case of admissions policies is a typical example. For the reasons cited earlier, companies often ask universities to make exceptions to some admissions criteria, and to expedite admissions decisions. While this is reflective of a true need on the part of the companies, it is easy to understand why universities often find it difficult to oblige.

One solution may be for the universities to allow companies to share some of the admissions responsibility and to facilitate the admissions process. Since both the university admissions office and the company training division share the objective of selecting candidates who will succeed in their programs, perhaps the admissions office can accept some of the company's selection criteria for one or two cases in a given group of candidates, provided the group as a whole meets the university requirements. In return, the company can assume more responsibility for its employees' performance, and take any necessary steps to ensure their success at the university.

Similarly, the problems of application lead and response times might be solved if the companies could commit themselves in advance to a certain number of placements, and if the

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university would allow the actual participants to be selected after the usual deadline. In such cases, the university would retain the right to deny any given applicant but would nevertheless need to have a high degree of confidence in the company's ability to produce qualified candidates.

The supervision and coordination of training is another example where companies often appear to be imposing on university procedures and resources. The university can meet some of these needs through its academic and foreign student advisors, but the company usually demands a higher degree of accountability than is required of most students. Some of these requirements can be satisfied by asking the employees to submit their own reports, but the best solution is still an on-site supervisor who is familiar with the guidelines of the training program, and can work with advisors, instructors, the registrar, and the employees themselves to assure proper implementation of the program and adequate reporting to the company. Clearly, this goes beyond the ordinary responsibilities of any campus advisor or instructor. The solution may therefore be for the university to designate a single individual on campus who can fulfill this role, and to grant that person release time for performing these functions. In return, the company can compensate the university for the proportion of that individual's duties which are spent providing for the company's needs.

Finally, there is the example of support services. Universities have long recognized the special needs of foreign students, and have usually established special offices to deal with them. These offices are aware that a full-time orientation program of one or two weeks prior to the academic term, coupled with ongoing assistance after the start of classes can do much to ease a foreign student's transition to the new environment. In these times of tight budgets, however, universities often assume that such programs are something of a luxury, and that foreign students will accept a certain amount of adversity if they are sufficiently committed. A company, on the other hand, cannot afford to view such services in this light because of the critical difference which they may make between an employee's decision to stay or return home —and the effect of that decision upon the company's investment in that employee. As a result, companies frequently request much more in the way of services than the universities feel they can reasonably offer. Here again, the answer may be for the university to provide the extra services, but with the company covering the costs. In fact, both the support and supervisory services can usually be coordinated by the same person on campus, and the agreement covered by a standard service contract drawn up by the company for use at each of its training sites.

THE POTENTIAL

Clearly, the above recommendations will demand much in the way of cooperation between industry and academia. However, companies have found that they must look beyond traditional in-house or contract training programs to meet their new training needs, and universities must respond to the changing demands in higher education. Both stand to gain much from such a partnership, and both will be serving the wider goal of developing tomorrow's leaders and professionals in the third world. To do any less would be to forsake their respective commitments and to risk their own future wellbeing. nu

طلب المعرفة

1. NBC White Paper, "America works when America Works," aired June 25, 1981.
   N Y Times Supplement: "Survey of Continuing Education." August 30, 1981.
2. Institute of International Education. Open Doors: 1979/80, Report on International Education Exchange. New York, 1981.
3. Loddeke, Leslie. "The Great Engineering Crisis: Firms Luring Young Graduates from Higher Education," Houston Chronicle, January 22, 1982.
4. I am indebted to Dr. Paul Pennington, Dean of Arts and Sciences at Louisana Tech University, for this suggestion, which, while not totally new in concept, has not to my knowledge been previously proposed as a solution to this particular problem.

Educaçâo ê una manera na busca de novos canais de comunicaçâo

Private Sector Approach:

Business Partners for a Good Deal

Trends

As the traditional business school approach comes under attack for obsolete programs which ignore many specialized managerial skills needed in high technology industries and international marketing, colleges of business and management are actively recruiting more advisors from industry to determine current market needs in graduate skills. Another demand is being made on private education from the international areas. Dr. Yasahiro Goh, distinguished executive from Japan, pointed out the growing importance of the Pacific Basin countries in the educational demand for technical as well as language skills.

"Finding the right people to meet these demands on the new College of Business and Management, is the first priority," said Donald Bibbero, dean of Northrop University's College of Business and Management. Faculty, money, and advisors were listed as the strategic triad of support for the business school.

Development

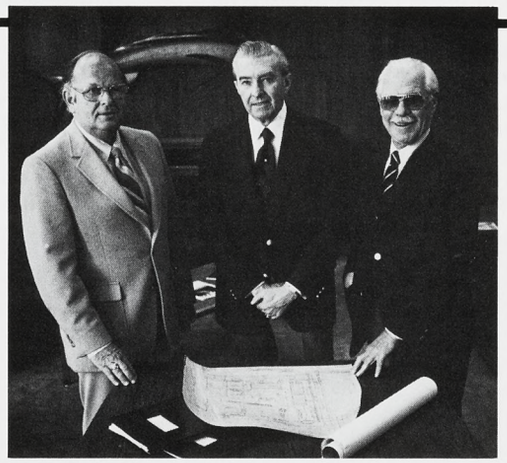
"Revitalizing the Business and Industry Advisory Board is the first step in realizing our goals," said the dean. The forty member international board met for the first time on April 2, 1982 in the Alumni Library.

New advisory board members include:

- Husan Mumtaz, owner of National Tyre Co. of Pakistan;
- Alejandro Orfila, Secretary General of the Organization of American States;
- Franklin Chang, Vice President, Nankang Rubber Tire Corp. Taiwan;
- Brigadier General Herbert Temple, Deputy Director Army National Guard, Pentagon;
- Senator Tan Chang Soong, Chief Executive Secretary, Malaysian Chinese Association;
- Abraham S. Bolsky, President, Tishman Construction, California.

New faculty members recruited from the Industry Advisory Board include A. Joseph Mahoney, former Sr. Vice President, Security Pacific Bank and Dr. Dennis Pollard, Vice President Cox Hobbies.

Colonel Daniel Lewis, former professor of communication, at University of Southern California, was selected as interim Chairman of the Business and Industry Advisory Board. His immediate concern is to mobilize a development committee within the Advisory Board to spearhead a fundraising effort from industry. A. Joseph Mahoney formerly of Security Pacific Bank and Philip Gardner of American Investments Concepts, Inc. are Chairman and Vice-Chairman respectively.



Strategic Development Triad: *A. Joseph Mahoney, (left), E.C. Noonan, Daniel Lewis.*

Forecast

"Recruiting management from the private business sector is one way to re-trench and attack economic problems in the private education sector," explained E.C. Noonan, former Vice President of Uniroyal International as he introduced himself to the Board as the new Vice President for Development at Northrop University. Noonan, specializing in international trade and marketing for over thirty years in the Far East, Pacific and North Africa, outlined his approach to University development as directed toward "joint cultural and business ventures in educational programs. We are looking for sources of funding, students, and programs," he itemized. "The Japanese want an educational-cultural exchange center here near the airport. Other small private colleges are looking for joint degree programs supplementing their curricula with the technical and engineering skills taught here at Northrop University. Corporations want more continuing education programs on-site for their employees in the fields of Management of Technology and International Marketing. We are working on all these areas," he reported.

"We are aggressive and determined," summed up the dean. "We mean to show progress by Fall 1982."

Technology Transfer:

English for all Specializations

Trends

Since 1944, when the International Civil Aviation Organization proposed that English be used as the international language of air traffic control, English has been the predominate language of aviation.

The export of aircraft from the United States also contributes to the predominance of English in the aircraft industry internationally, since manufacturers like Boeing, Douglas, and Lockheed all publish the Technical operations and maintenance in English. Research reports, and reference materials concerned with aviation are often published in English, making it a common denominator of communication within the aircraft industry.

The international push for training in technology and for higher education in the sciences during the last decade has created a greater demand for specialized English skills among foreign students studying in the United States. "With a large population of students majoring in aerospace engineering, aircraft maintenance, electronic engineering, and business, there was a definite need for English to be taught within the context of the special fields of study," explained Diana Bahr, director and founder of the Language Institute at Northrop University.

During the 1970's, the OPEC countries and developing nations began increasing the number of students entering the United States to study technical and engineering fields. Iran, Nigeria, Saudi Arabia, and Venezuela became the leading exporters of students.

"This represents a dramatic shift from the general humanities student to the highly specialized students of the 1980's" added Diana Bahr.

Development

In 1976 the Language Institute at Northrop University developed the first aircraft technical English course in the United States. "It was unique to the educational scene," explained Director Bahr. "English language teachers often ask how it was possible to write a technical English program for aircraft maintenance. We could not have done it without working closely with the faculty of the Institute of Technology. They provide us with the continuing technical resources we need to write and refine the program."

Ann Aquirre, a member of the Language Institute faculty, wrote the first technical aircraft English text, The Northrop University Language Institute Technical English Self-Study Program, which is currently used by the United States Navy for training in Kuwait and by Tunis Air in Tunisia.

The special purpose English courses developed by the Language Institute resulted in contract education with foreign governments and international corporations. ARAMCO, Saudi Arabian Airlines, Gulfstream American Corporation, and the Algerian Government are currently sponsoring groups of students in the Language Institute.

"Corporations doing business internationally often provide training packages with their manufactured products, and in some cases they insist a language training program be included," Diana Bahr said. Gulfstream American Corporation, an aircraft manufacturer, provides the foreign purchasers of its jets with a training package which includes language training at Northrop University.

"It is a highly specialized skill to be able to teach the language of a technical area without getting into the teaching of the technology itself," Diana Bahr emphasized. Aircraft Technical English, English for Engineers, and Business and Management English all emphasize a specialized vocabulary, the use of concrete terms and ideas, the importance of ordering and sequencing, and an ability to describe functions and operations.

Forecast

Future activities of the Language Institute involve sharing the advances and inroads made in the fields of special purpose English teaching. "We will participate in the international exchange of instructors and the international publishing of more texts," offered Diana Bahr.

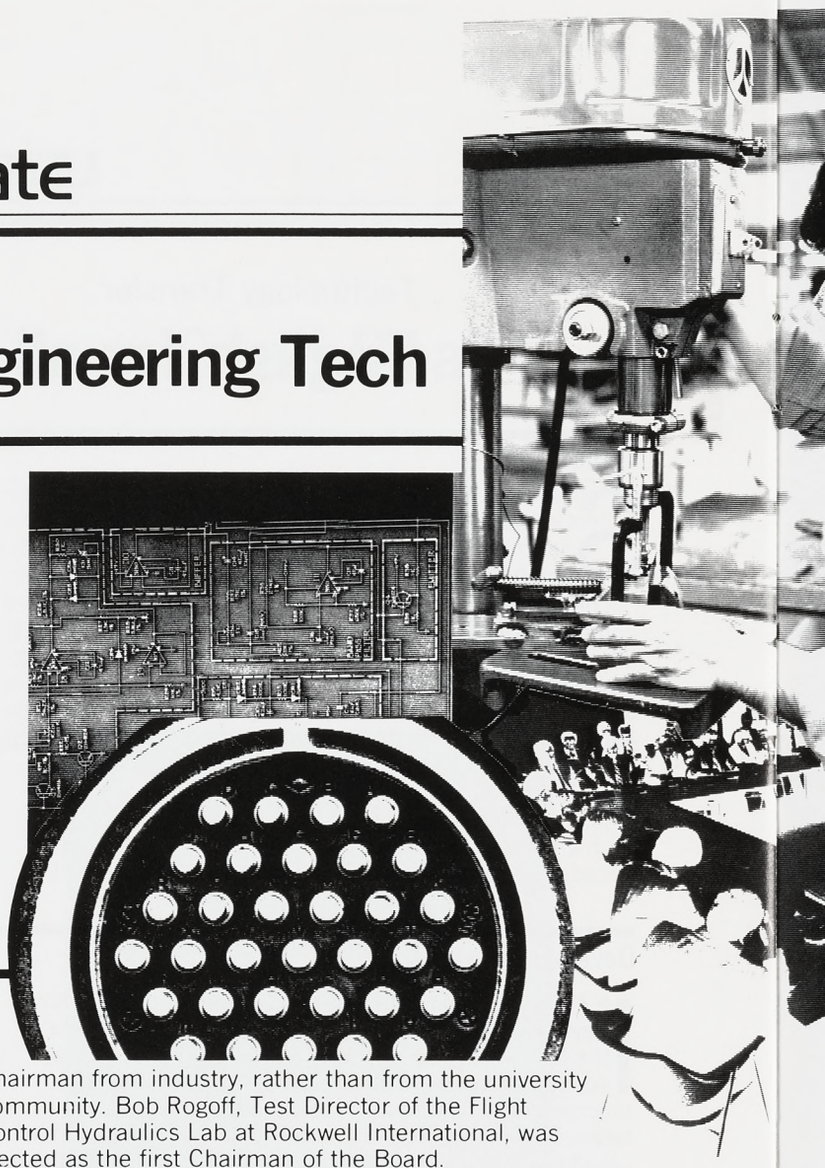
Countries concerned with setting up their own language training programs have requested the assistance of the Language Institute.

During the fifth anniversary year of the Language Institute, there will be a new goal added to the Institute's immediate plans. "We not only want to teach the language of technology, we also want to teach with the new techniques made possible through technology. Language teaching with computers and video is a natural development."

The next step in language teaching and communication again depends on technology. nu

Goes Public:

Industry Invests In Engineering Tech



Trends

To paraphrase Shakespeare, 'What is education to industry, or industry to education?' The answer these days is 'everything,' especially in engineering education which requires large capital investment in equipment and constant curriculum development.

Today, industry is considered the only realistic source of laboratory equipment for high technology programs. In many cases, universities are asking industry for hardware donations, advice on curriculum planning, large donations of time from high-level employees, and active help in placing graduates. The key to a successful response from industry depends on a highly structured organizational plan predicated on specific University needs and developed through select and motivated industry members.

Development

The College of Engineering Technology at Northrop University approached the problem with an organizational plan which is already measuring success. "You have to be able to show industry the profits of investing time and money in the University," explained Leon Daugherty, Dean of the College of Engineering Technology. "You have to explain the mutual benefits of working together in education."

With an advisory board of key people invited from major industries, airlines, aerospace, and career guidance organizations, the College of Engineering Technology began its industry involvement plan with a personally motivated group. "One of the strongest factors contributing to success is the involvement of alumni in key industry positions," Dean Daugherty suggested. "They are already twice motivated, once for their industry and then for their alma mater. If the member industries are directly involved with the hiring of the University's graduates, you have a winning team," he added.

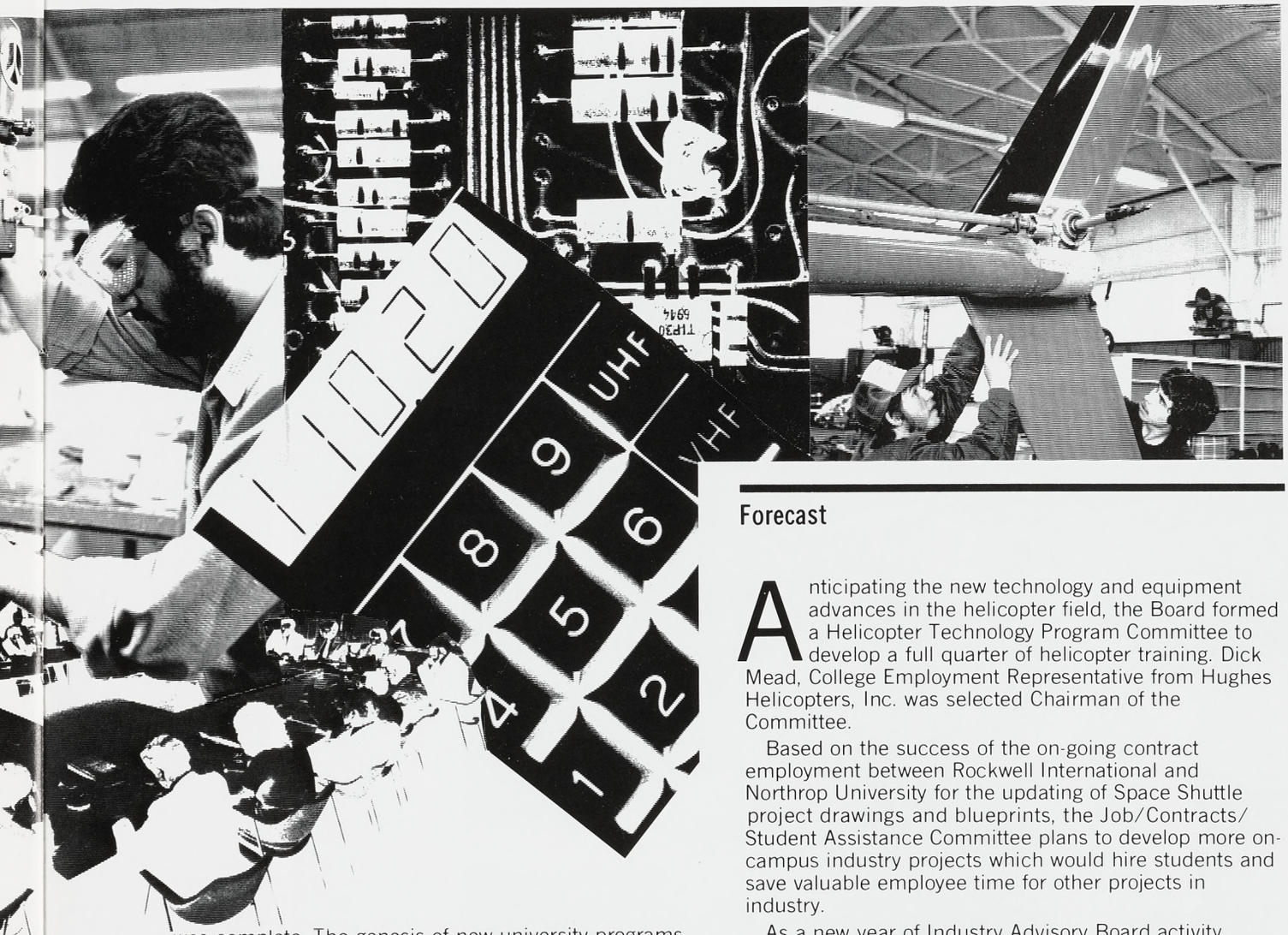
To fortify the strength of the team, members of the Industry Advisory Committees of the College of Engineering Technology and of the Institute of Technology decided to consolidate into a hefty fifty-one member Industry Advisory Board concerned with both the Institute and the College.

To assure industry leadership in the development of the University, the new Industry Advisory Board elected a Chairman from industry, rather than from the university community. Bob Rogoff, Test Director of the Flight Control Hydraulics Lab at Rockwell International, was elected as the first Chairman of the Board.

At the same time, the Board voted to become more actively involved in University program development by appointing working committees to zero-in on curricula needs. Within six months of the committees formation, both the Manufacturing Engineering Technology Committee, chaired by Brian Boyer, Manager of the Machine Center at Northrop Aircraft, and the Avionics/Electronics Technology Committee, chaired by Tom McGhee, Contracts Specialist in Maintenance Engineering at Trans World Airlines, prepared suggested course outlines for curriculum development of the two programs.

Meanwhile, through the efforts of a Board member, Stan Sponholz, Senior Vice President, retired, of Universal Heritage Investment Corp., the University received commitments from Douglas Aircraft Company to donate a Numerical Machine Tool Controller and from Northrop Aircraft Company to donate two Numerical Control Milling Machines. The equipment will form the nucleus of a Numerical Control Maintenance option to the Electronics/Avionics program.

By January 12, 1982, just ten months after the formation of the new Industry Advisory Board, the transition to industry leadership and active participation



was complete. The genesis of new university programs was now spearheaded by industry members in direct participation with University faculty and staff. Board members reported on employment needs, job training requirements and other critical concerns of; industry.

The Job/Contract/Student Assistance Committee was formed to help industry find needed employees among students and graduates, and to help develop contract employment for groups of engineering technology students in need of real-world experience before college graduation. George Kidd, Industrial Engineer in Manpower Control at Lockheed California, was selected as Chairman of the committee.

Within one year, the Industry Advisory Board completed a course outline for a proposed certificate program in Electronics/Avionics/Numerical Control which will be offered in September, 1982. The Manufacturing Engineering Technology Committee completed the initial description of a four-year program stressing orientation with industry. Representatives from Hughes, Lockheed, Rockwell and McDonnell Douglas voiced support of the program which is presently under review by the University.

Commitments to machinery donations materialized in the recent delivery of the first of two three-axis numerical control horizontal milling machines to be donated by Northrop Corporation and a NC Machine Tool Controller by Cincinnati Milacron Company.

Forecast

Anticipating the new technology and equipment advances in the helicopter field, the Board formed a Helicopter Technology Program Committee to develop a full quarter of helicopter training. Dick Mead, College Employment Representative from Hughes Helicopters, Inc. was selected Chairman of the Committee.

Based on the success of the on-going contract employment between Rockwell International and Northrop University for the updating of Space Shuttle project drawings and blueprints, the Job/Contracts/Student Assistance Committee plans to develop more on-campus industry projects which would hire students and save valuable employee time for other projects in industry.

As a new year of Industry Advisory Board activity begins, development is already underway on a Numerical Control curriculum. It is anticipated that students will enroll in the program by January, 1983.

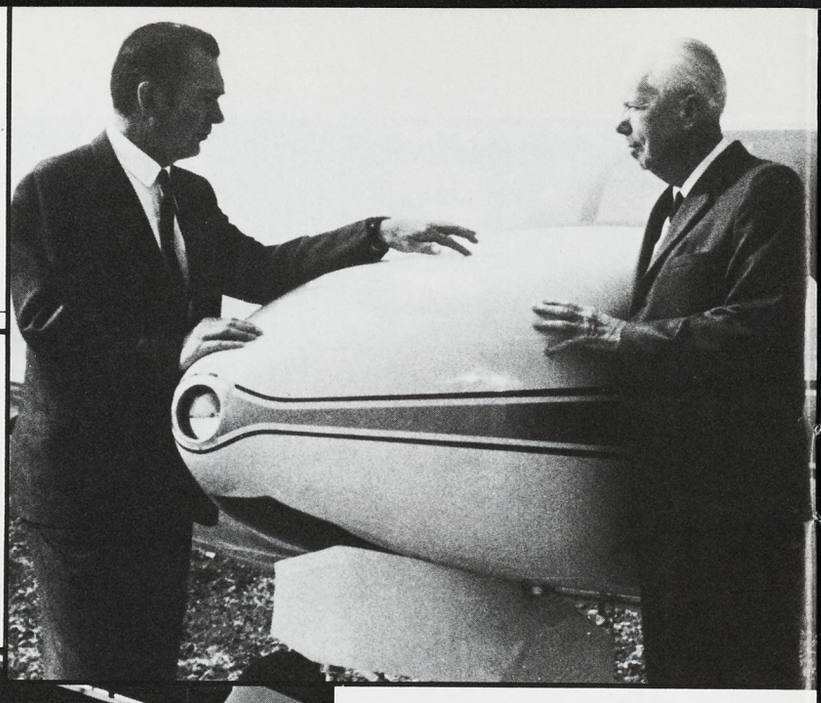
Through the valuable resources in industry the Board determined that graduates with a Bachelor of Science in Engineering Technology/Aircraft Maintenance option, still require up to one and one-half years of on-the-job training to qualify for advancement into maintenance planning. Considerably more experience is needed to qualify for promotion to a management level.

With the complexity of factors involving the operation, support and maintenance of transport aircraft, the Board formed an Aircraft Maintenance Management Curriculum Committee, chaired by Bill Denison, Sr., Maintenance Planning Engineer in Product Support at Douglas Aircraft. The committee will develop a four year program to provide inservice maintenance management of transport aricraft with professional employees without the need for lengthy on-the-job training.

Judging from one year's investment in education, industry stands to receive substantial returns on its time and donations in the form of more qualified and specifically prepared graduates and a continuing education opportunity for current employees.

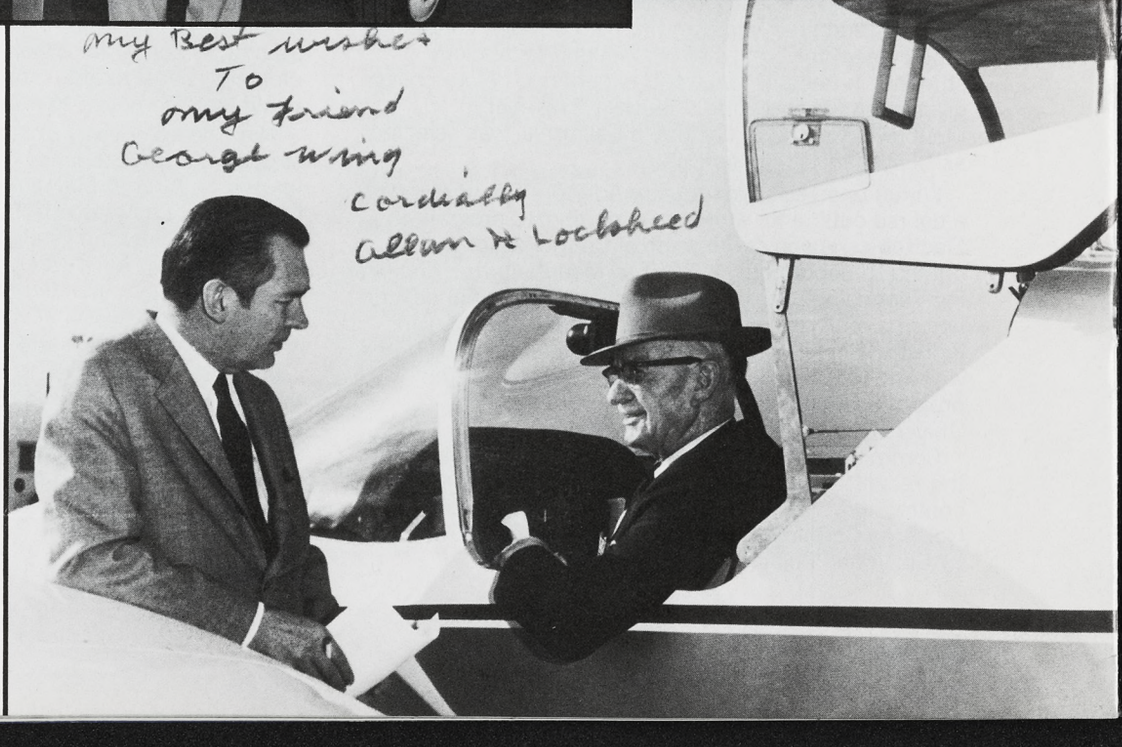
historical greats

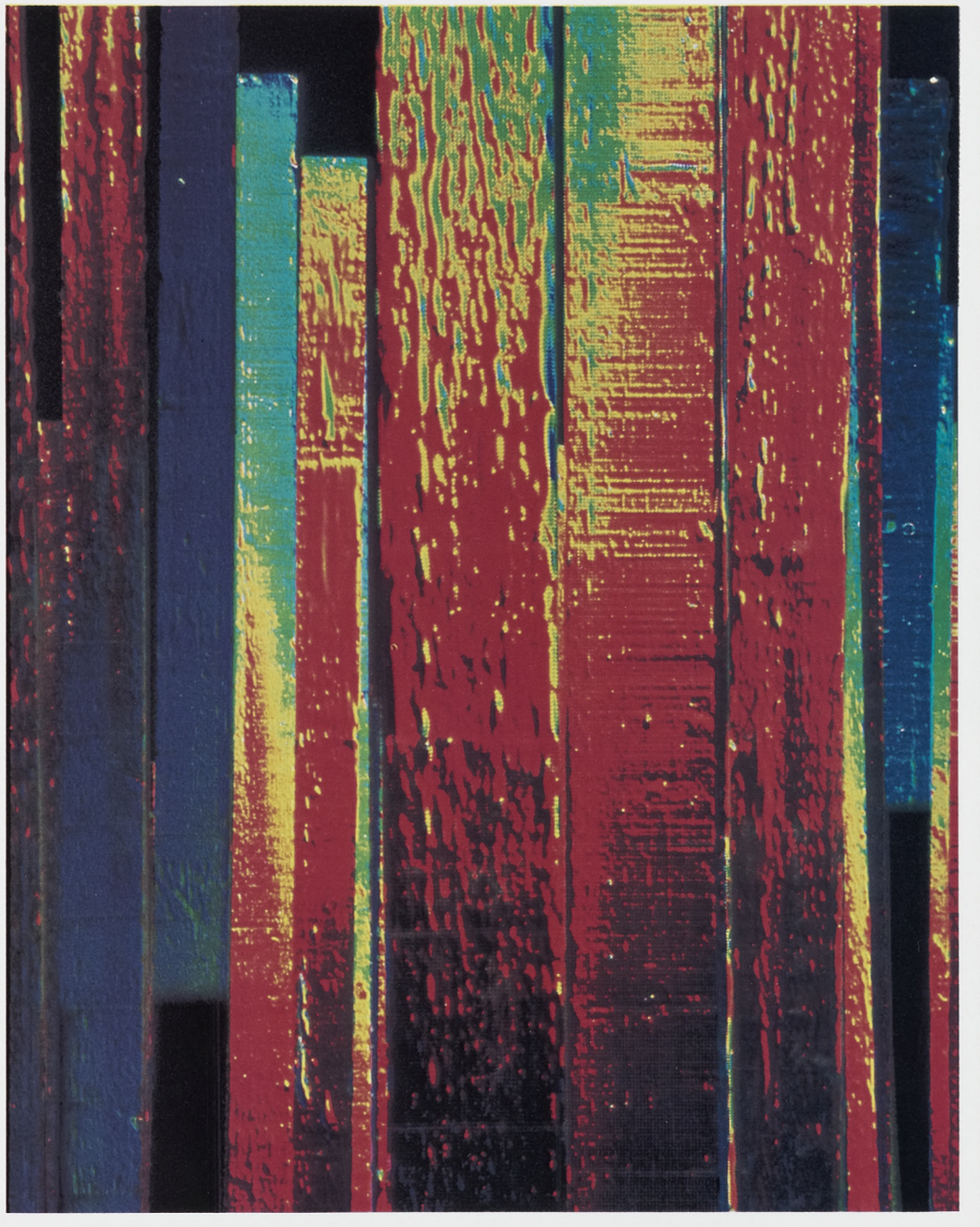
The American Hall of Aviation History holds a collection of rare photographs celebrating important moments in world aviation.



Aircraft designer, George Wing, presents The Derringer to three greats of the aviation industry: (top) John K. Northrop with George Wing, (left) Donald Douglas inspecting the Derringer and (bottom) Allan Lockheed in the cockpit of the Derringer.

The American Hall of Aviation History at Northrop University provides research, photographs, film and rare books on the beginnings of flight through the present. Research and copies of prints are available by writing: Librarians, AHAH, Northrop University, Inglewood, California

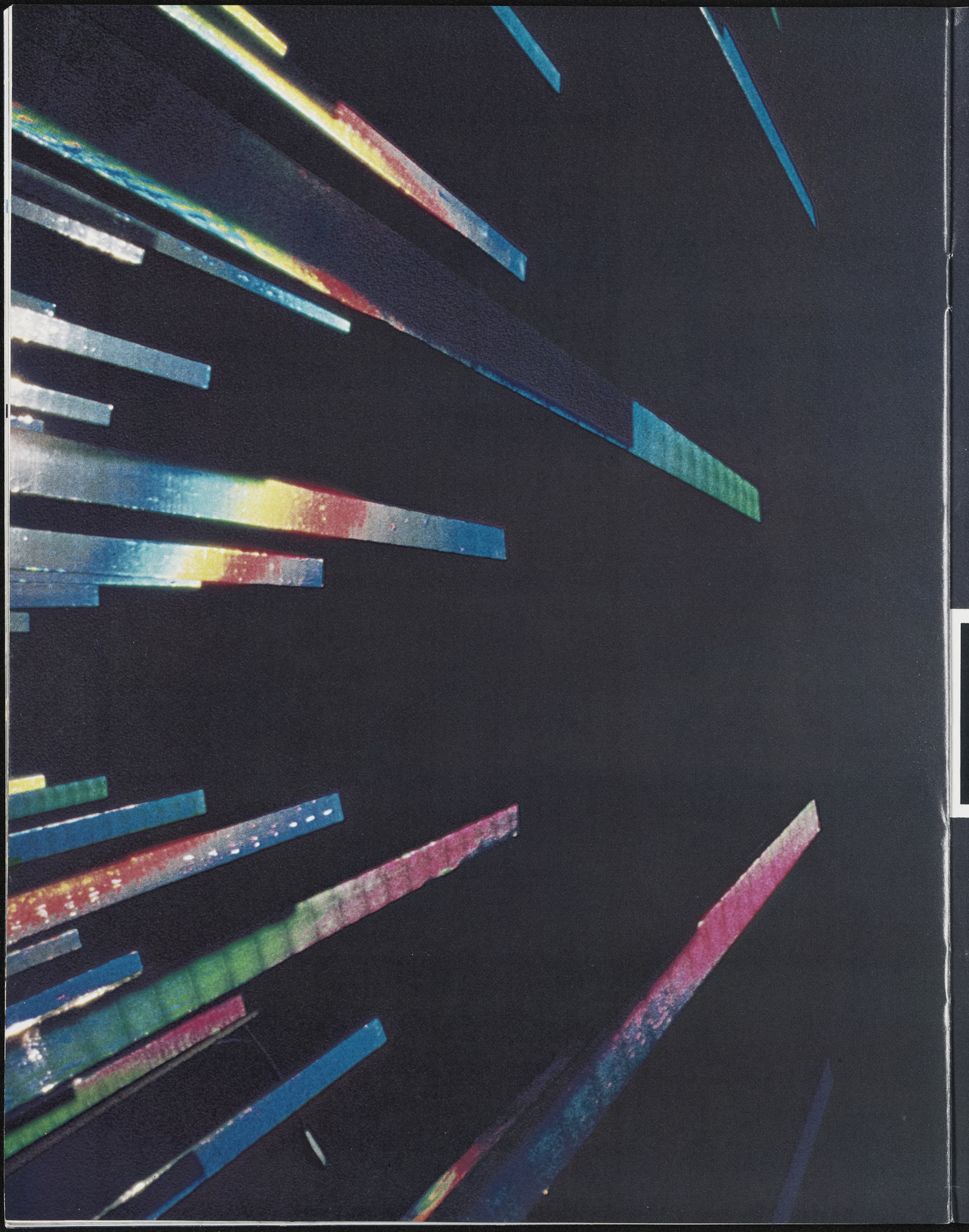




LIGHT CELEBRATIONS

Dale Eldred celebrates light in monuments of spectra explosions which change hue and intensity as the earth rotates around the sun. His exhibits of monumental light sculptures at the Nelson Gallery in Kansas City, Missouri, invite people to stand and watch as the colors change from vivid reds and yellows, to muted tones in moonlight.

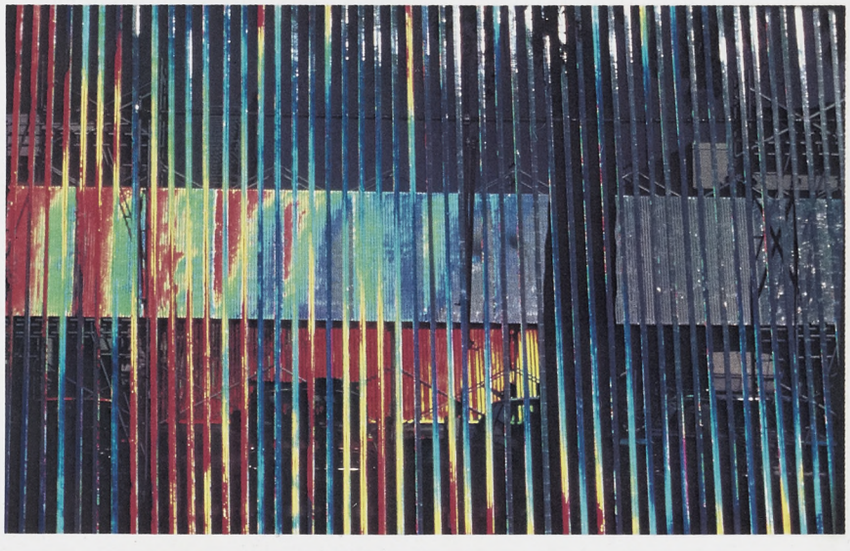
Eldred is currently constructing a sun celebration the size of the entire Helsinki Square in Finland for the occasion of the summer solstice. He thinks on a monumental scale. At the site of his Phoenix Art Museum project in Arizona, he brought in forty-six thousand pounds of steel, twenty-four thousand feet of diffraction tape, two truckloads of scaffolding, and three truckloads of construction equipment to build a



dramatic rainbow-colored solar screen which tracks the sun's positions.

Recognized internationally for his mylar-bonded aluminum pillars with special diffraction grating which break light into a burst of spectra, Eldred sees himself as a builder of modern monuments to time as it is experienced in light and color.

"The vital element in any of my work," he explains, "is not the sun or the movement of the earth, but the vital human perception of the relationships between them." nu



(opening page) Brilliant and constantly changing hues are seen in this detail from the "Instant Time" exhibit at the Kansas City Museum. The project consisted of 16-foot high poles lining a 500-foot long area in the center divider of the main boulevard. Each pole radiates with color when illuminated by passing headlights. The showing was also a favorite of passersby (large photo) who could enjoy a skyward view at dusk in the midst of a rainbow forest. Visitors silhouetted against large diffraction panels in the Laurmier Sculpture park (top). Rainbow wall at Phoenix Art Museum — Night lights and moonlight diffract a series of rainbows on the wall.

International Esprit de Corps

***Cultural hospitality** in the Arabic tent. During International Week, trustee Ron Collins, (second from right) and B.J. Shell, (right) share memories of visits to Saudi Arabia.*

Forum takes hard-line on role of University in world trade, economics and commerce

A Forum on International Education at Northrop University provided the opportunity for discussion of the role of international studies and American higher education in the political and economic developments around the world.

With students from over thirty nations currently enrolled at Northrop University, the cultural, political and economic impact of American higher education becomes increasingly obvious.

The forum of business leaders, consul generals, airline and aviation industry representatives, which met at Northrop University, decided unanimously that it falls to American universities to help correct the U.S. deficit of working knowledge in a world market. "There is an opportunity for universities to open doors to world markets through new plans for international studies" the forum concluded.

John Norberg, Chairman of the Board of Trustees of Northrop University, challenged the forum with his opening remarks. "Sensitivity of Americans to the need for international studies is growing very slowly. I am astounded how provincial my own thinking is. I had to look around Jeddah, in Saudi Arabia, and later Malaysia, to realize the global effects of an international education," he said. "After visiting with so many government and military leaders who had graduated from Northrop University, I realized education is probably the most powerful influence in world economics and politics. It is certainly a very basic influence."

While in Malaysia, Dr. B.J. Shell, President of Northrop University and John Norberg met with the General of All Armed Forces of Malaysia to discuss the influence of American higher education on the returning Malaysian students. Dr. Shell reported on the General's response:

"'They have learned the American attitude toward work and achievement,' the General told us. 'The hundreds of students returning from their education at Northrop University have come back to take charge, to make decisions. They are real leaders!"

Norberg added, "According to the Executive Director of the U.S. National Council on Foreign Languages and International Studies, the Soviet Union spends over $2 billion dollars annually to promote that kind of cultural exchange which the General in Malaysia witnessed. While the Soviets sponsored 24,000 African students in Soviet universities in 1980, the United States sponsored only 1,800 African students. Apparently, it is up to the private universities to provide the forum for Third

***Students from over thirty countries** participate in cultural sharing through the skillful coordinating of Meriam Wilhelm, International Student Adviser.*

***Main Campus** of Northrop University during International Week.*

> "When I stop to think of all our graduates around the world in command positions as vice presidents and directors, generals and entrepreneurs, I realize the effect we do have on international politics and economics."
>
> Dr. B.J. Shell
> President, Northrop University

***Trustees** Robert Strub and John Norberg join in International celebrations.*

World participation in American higher education."

Dr. Shell continued to identify the new thrust of higher education. "When I stop to think of all our graduates around the world in command positions as vice presidents and directors, generals and entrepreneurs, I realize the effect we do have on international politics and economics."

Another result of American education in global areas, is a correspondent increase in trade with the United States. "When we visited Saudi Arabia, especially those areas where our students are now in command, we noticed that all the equipment used in the laboratories was American-made. I think the high correlation between global exchange in education and in trade is obvious. We visited other countries," Dr. Shell continued, "where the percentage of American educated students was not as high, and the same type of laboratory equipment was imported from Germany and England, primarily because the young people have been educated in those particular areas of the world. We start training young people and we end up trading with them," he concluded.

The subject of international trade was raised by Ed Noonan, former Vice President of Uniroyal International and now Vice President of Development at Northrop University.

"The full impact of education on world trade has yet to be imagined," he opened. After thirty years abroad in international marketing, production and trading, Noonan was tough on what he called "complacent American business attitudes toward learning how to operate in a world market."

He saw the problem from the domestic side. "We are provincial, at best," he goaded the forum. "The U.S. is the largest market and producer in the world and yet we still import almost twice what we export."

In explaining the current American crisis in world trade, he pointed a finger at the American system of higher education. "Our universities have let us down. They don't teach us international methods of marketing for different specialized areas of the world, nor the ways of dealing in currency exchange and conversion in open markets, much less the ways of operating large-scale merchandise transfers with the use of banking instruments as payment, such as letters of credit.

"Every American graduate student in business who came to work for me in the international market had to be placed in expensive and time-consuming in-house training courses for the first six months. And this only enabled them to start as salesmen. I was appalled at what American graduate schools were NOT teaching in international business," Noonan volunteered.

"The U.S. participation in the world market has decreased to less than 12%. This reflects a deeper deficit than just money. The United States is currently suffering from a deficit of ability to communicate and deal in international markets. It is a deficit of technical business knowledge as well as cultural sensitivity," he concluded.

"With only one-tenth of one percent of American college students studying Japanese, and not one qualified interpreter in the U.S. Government to translate simultaneously from Chinese to English during the visit of Prime Minister Deng Xiaoping in 1979, it is hard to imagine how we could participate successfully in international markets." Noonan added rather forcefully.

The Forum on International Education convened with the resolve to correct as much of the U.S. deficit of global understanding as possible through curriculum expansion and global programs of student exchange.

SHOW YOUR COLORS

Show your school colors in the office, at home, and when you need that special gift. The Campus Store offers sports wear, decorator items and accessories - all with the visible Northrop University image.

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1) *16 x 20" color reproduction of "the Spirit of John K. Northrop" oil painting by Douglas Ettridge.* **$19.50**

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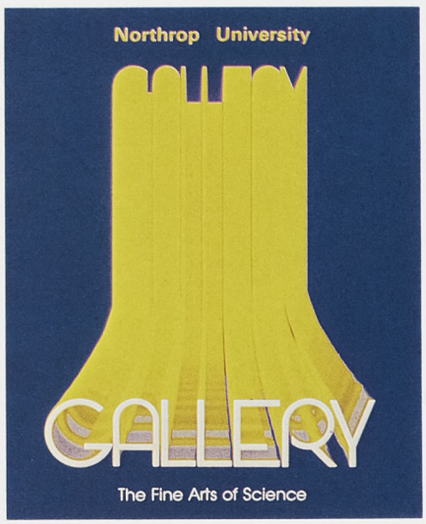
calendar

School of Law Celebrates Tenth Anniversary

The School of Law Graduation Exercises in June commemorated the founding of the School in 1972 and bestowed the title of Distinguished Professor of Law on John Gaims, the first professor of law at Northrop University.

John Perkins, Director of the Inglewood Public Library, received the Community Service Award for his outstanding services to the School of Law and the Law Library.

Moya Olsen Lear, wife of William P. Lear, aviator inventor and aircraft manufacturer, received a Doctor of Law degree, honoris causa, for her long-standing association and support of the School of Law.



Gallery Opens *at Northrop University*

The Northrop University Gallery of Technology and the Arts opens this summer in the glass lobby of the 5800 building on West Campus with a neon and ultraviolet light show designed by Barry Fahr.

Historical West Campus

During the 40th Anniversary Year, Northrop University commemorated the historical significance of the West Campus on Arbor Vitae. On June 26, a bronze plaque was placed on the present site of the University's West Campus which during the 1955 to 1962 served as the headquarters of the United States Air Force Intercontinental Ballistic Missile program and the Air Force Space Programs, directed by General Bernard A. Schriever.

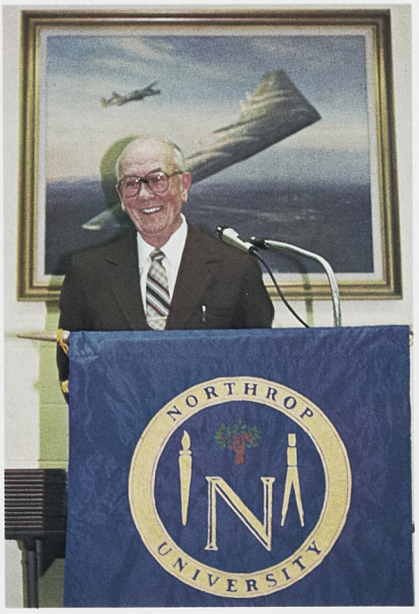
At the June graduation exercises, General Schriever received an Honorary Doctor of Science degree for his pioneering work in the development of the ballistic missile program responsible for the Thor, Atlas, Titan and Minuteman Missile Systems.

General Schriever is currently a director of Eastern Air Lines, Emerson Electric, American Medical International, Control Data Corporation, and the Wackenhut Corporation.

Penguins on icebergs *were part of an Armchair Expedition to Antarctica presented by Friends of the Library.* *Photography by Leon Daugherty.*

In Memoriam

Northrop University laments the passing of a dear friend, Richard Smith, who died on June 3, 1982. Dick Smith, engineering draftsman, artist, sculptor, and English professor, taught at Northrop University for twenty-two years. After retiring, he painted the oil portrait of John Northrop which currently hangs in the Alumni Library.



Charles Dietrich *gives a farewell speech*

Charles Dietrich, instructor at the Institute of Technology for over thirty years, retired this April with honors, celebrations, and a promise to return to work the following Monday. He had not missed one day of teaching in thirty years and he had been late only once. The up-coming 40th Anniversary issue of NUANCE features an indepth story about Charlie and his pioneer friends, Tony Vai and Tex Hilley.

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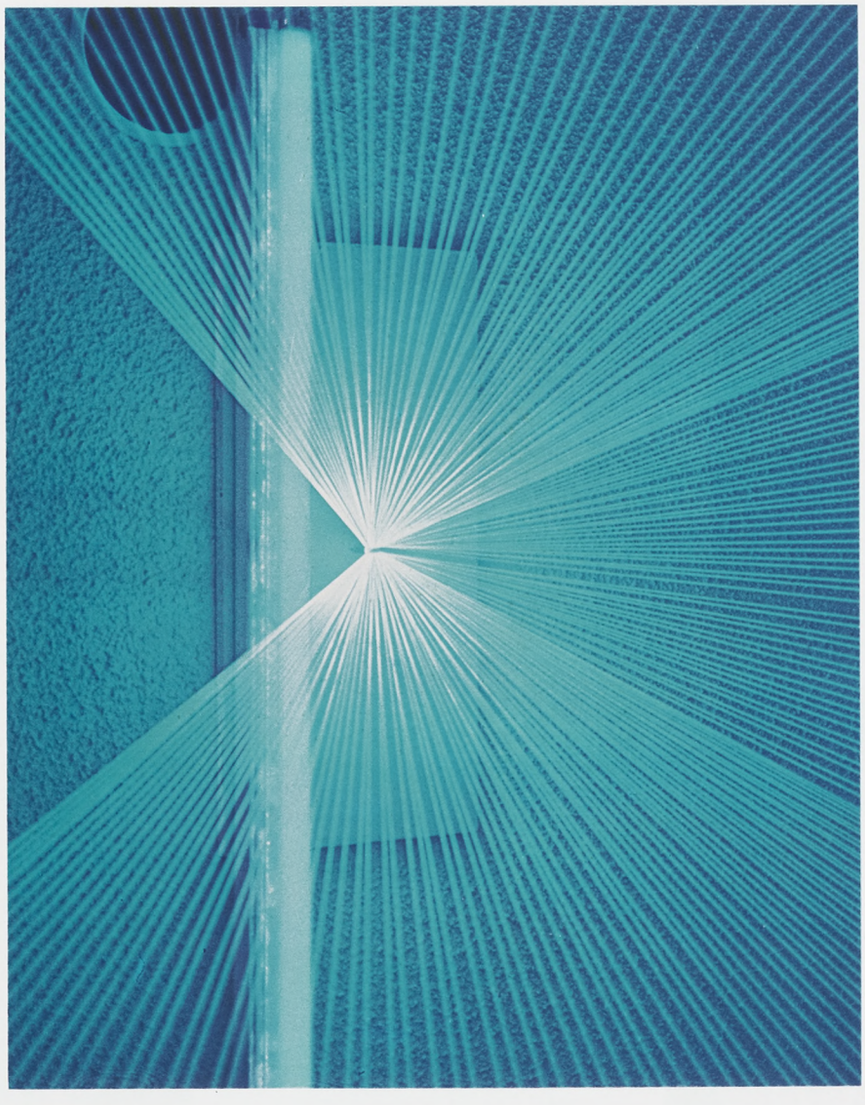

Gallery Shows Fine Line Between Art and Technology

Ultraviolet and neon light sculptures by Barry Fahr open Northrop University Gallery of Technology and the Arts with a walk-through flouresscent monofilament design structure illuminated by ultraviolet light. Barry Fahr teaches color theory at Otis-Parsons Institute of Design and U.C.L.A. extension. He exhibits at Barnsdal Park and Cal Tech, Pasadena.

As a showcase of innovative industrial design and advances in communication arts, the University Gallery will feature a September exhibit by Information International and the computer animation in the film industry; a November showing of Organic Form in computer art by Howard Ganz; and a Winter solstice exhibit of mylar, mirrors and metal prisms by Dale Eldred, this issue's cover artist.

Founded in 1942, Northrop University has grown from an aviation technician training school into a private, non-profit, fully-accredited senior institution offering a diverse graduate and undergraduate curriculum in the Colleges of Engineering, Engineering Technology, Business and Management and the School of Law. Certificate programs are offered in the professional areas of technical language training and airframe and powerplant maintenance.

The University has over 20,000 alumni and a current enrollment of 1800 students from over 33 countries. The sixteen-acre campus is located near the Los Angeles International Airport in Inglewood, California.

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